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NASA Scientific and Technical Publications

A Catalog of Special Publications, Reference Publications, Conference Publications, and Technical Papers

1988

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NASA Scientific and Technical Publications Catalog 1988

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1988

National Aeronautics and Space Administration
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PREFACE

The pursuit of human knowledge through scientific research and technical endeavor has vastly expanded understanding of our world and the universe we live in. The contributions of NASA through scientific and technical research and development affect not only our understanding and use of aeronautics and space but also touch our daily lives. Geologists, oceanographers, meteorologists, archeologists, aircraft engineers, aerospace decision makers, land-use planners, historians, and rescue teams all make use of the results of NASA's research. The findings of this research and development are published in NASA's scientific and technical report series as a part of NASA's mandate to disseminate the results of the agency's far-reaching work.

This catalog provides a list of NASA publications from four report series entered into the NASA scientific and technical information database during accession year 1988. For previous lists, see NASA Publications *Records of Achievement*, NASA SP-470 (accession number N83-33792), *NASA Scientific and Technical Publications: A Catalog of Special Publications, Reference Publications, Conference Publications, and Technical Papers, 1977-1986*, NASA SP-7063(01) (accession number N87-30218). Supplement 02 of this catalog lists NASA publications announced in 1987. Two semimonthly abstract journals cover all aspects of aeronautics and space research, NASA and non-NASA, nationally and worldwide: *STAR (Scientific and Technical Aerospace Reports)*, which focuses on scientific and technical reports, and *IAA (International Aerospace Abstracts)*, which covers the open literature. These are available by subscription from, respectively, the U.S. Government Printing Office and the American Institute of Aeronautics and Astronautics, Inc., (see page vi).

This catalog includes publicly available reports from four NASA report series: Special Publications (SPs), Reference Publications (RPs), Conference Publications (CPs), and Technical Papers (TPs). The scope of each series is defined as follows:

Special Publications are often concerned with subjects of substantial public interest. They report scientific and technical information derived from NASA programs for audiences of diverse technical backgrounds.

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Conference Publications record the proceedings of scientific and technical symposia and other professional meetings sponsored or cosponsored by NASA.

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Presented here are citations for reports from each of these series. An explanation of the elements in a typical citation follows. Accession numbers (N numbers) at the end of a citation are separate citations to articles within the report. Please use *STAR* to locate these citations.

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ERIC BURGESS and DOUGLASS TORR 1987 172 p Original
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The need to study the lower thermosphere with the new instrument, data handling, and spacecraft technology available in the 1960s led to the formulation and establishment of the Atmospheric Explorer program. This book provides an overview of this program with particular emphasis on the AE3, AE4, and AE5 satellites, which represent early examples of problem-dedicated missions. Both the satellites and their instrumentation on the one hand and the experimental and scientific considerations in studying the thermosphere on the other are discussed. J.P.B.

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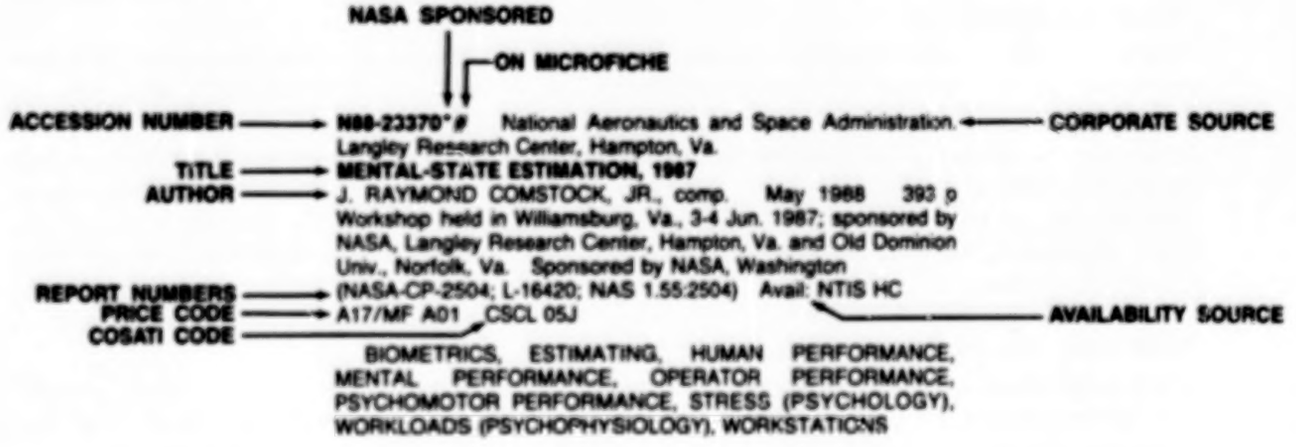

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For related information see also *Astronautics*.

01 AERONAUTICS (GENERAL) 1

02 AERODYNAMICS 2

Includes aerodynamics of bodies, combinations, wings, rotors, and control surfaces; and internal flow in ducts and turbomachinery.

For related information see also *34 Fluid Mechanics and Heat Transfer*

03 AIR TRANSPORTATION AND SAFETY 4

Includes passenger and cargo air transport operations; and aircraft accidents.

For related information see also *16 Space Transportation* and *85 Urban Technology and Transportation*.

04 AIRCRAFT COMMUNICATIONS AND NAVIGATION N.A.

Includes digital and voice communication with aircraft; air navigation systems (satellite and ground based); and air traffic control.

For related information see also *17 Space Communications, Spacecraft Communications, Command and Tracking* and *32 Communications and Radar*.

05 AIRCRAFT DESIGN, TESTING AND PERFORMANCE 4

Includes aircraft simulation technology.

For related information see also *18 Spacecraft Design, Testing and Performance* and *39 Structural Mechanics*. For land transportation vehicles see *85 Urban Technology and Transportation*.

06 AIRCRAFT INSTRUMENTATION 5

Includes cockpit and cabin display devices; and flight instruments.

For related information see also *19 Spacecraft Instrumentation* and *35 Instrumentation and Photography*.

07 AIRCRAFT PROPULSION AND POWER 5

Includes prime propulsion systems and systems components, e.g., gas turbine engines and compressors; and onboard auxiliary power plants for aircraft.

For related information see also *20 Spacecraft Propulsion and Power, 28 Propellants and Fuels*, and *44 Energy Production and Conversion*.

08 AIRCRAFT STABILITY AND CONTROL 6

Includes aircraft handling qualities; piloting; flight controls; and autopilots.

For related information see also *05 Aircraft Design, Testing and Performance*.

09 RESEARCH AND SUPPORT FACILITIES (AIR) 6

Includes airports, hangars and runways; aircraft repair and overhaul facilities; wind tunnels; shock tubes; and aircraft engine test stands.

For related information see also *14 Ground Support Systems and Facilities (Space)*.

ASTRONAUTICS

Includes astronautics (general); astrodynamics; ground support systems and facilities (space); launch vehicles and space vehicles; space transportation; space communications, spacecraft communications, command and tracking; spacecraft design, testing and performance; spacecraft instrumentation; and spacecraft propulsion and power.

For related information see also *Aeronautics*

12 ASTRONAUTICS (GENERAL) 6

For extraterrestrial exploration see *91 Lunar and Planetary Exploration*.

13 ASTRODYNAMICS 6

Includes powered and free-flight trajectories; and orbital and launching dynamics.

14 GROUND SUPPORT SYSTEMS AND FACILITIES (SPACE) N.A.

Includes launch complexes, research and production facilities; ground support equipment, e.g., mobile transporters; and simulators.

For related information see also *09 Research and Support Facilities (Air)*.

15 LAUNCH VEHICLES AND SPACE VEHICLES 7

Includes boosters; operating problems of launch/space vehicle systems; and reusable vehicles.

For related information see also *20 Spacecraft Propulsion and Power*.

16 SPACE TRANSPORTATION 7

Includes passenger and cargo space transportation, e.g., shuttle operations; and space rescue techniques.

For related information see also *03 Air Transportation and Safety* and *18 Spacecraft Design, Testing and Performance*. For space suits see *54 Man/System Technology and Life Support*.

17 SPACE COMMUNICATIONS, SPACECRAFT COMMUNICATIONS, COMMAND AND TRACKING N.A.

Includes telemetry; space communications networks; astronavigation and guidance; and radio blackout.

For related information see also *04 Aircraft Communications and Navigation* and *32 Communications and Radar*.

18 SPACECRAFT DESIGN, TESTING AND PERFORMANCE 7

Includes satellites; space platforms; space stations; spacecraft systems and components such as thermal and environmental controls; and attitude controls.

For life support systems see *54 Man/System Technology and Life Support*. For related information see also *05 Aircraft Design, Testing and Performance*, *39 Structural Mechanics*, and *16 Space Transportation*.

19 SPACECRAFT INSTRUMENTATION N.A.

For related information see also *06 Aircraft Instrumentation* and *35 Instrumentation and Photography*.

20 SPACECRAFT PROPULSION AND POWER 7

Includes main propulsion systems and components, e.g. rocket engines; and spacecraft auxiliary power sources.

For related information see also *07 Aircraft Propulsion and Power*, *28 Propellants and Fuels*, *44 Energy Production and Conversion*, and *15 Launch Vehicles and Space Vehicles*.

CHEMISTRY AND MATERIALS

Includes chemistry and materials (general); composite materials; inorganic and physical chemistry; metallic materials; nonmetallic materials; propellants and fuels; and materials processing.

23 CHEMISTRY AND MATERIALS (GENERAL) 8

24 COMPOSITE MATERIALS 8

Includes physical, chemical, and mechanical properties of laminates and other composite materials.

For ceramic materials see *27 Nonmetallic Materials*.

25 INORGANIC AND PHYSICAL CHEMISTRY 8

Includes chemical analysis, e.g., chromatography; combustion theory; electrochemistry; and photochemistry.

For related information see also *77 Thermodynamics and Statistical Physics*.

26 METALLIC MATERIALS N.A.

Includes physical, chemical, and mechanical properties of metals, e.g., corrosion; and metallurgy.

27 NONMETALLIC MATERIALS 8

Includes physical, chemical, and mechanical properties of plastics, elastomers, lubricants, polymers, textiles, adhesives, and ceramic materials.

For composite materials see *24 Composite Materials*.

28 PROPELLANTS AND FUELS N.A.

Includes rocket propellants, igniters and oxidizers; their storage and handling procedures; and aircraft fuels.

For related information see also *07 Aircraft Propulsion and Power*, *20 Spacecraft Propulsion and Power*, and *44 Energy Production and Conversion*.

29 MATERIALS PROCESSING 8

Includes space-based development of products and processes for commercial application.

For biological materials see *55 Space Biology*.

ENGINEERING

Includes engineering (general); communications and radar; electronics and electrical engineering; fluid mechanics and heat transfer; instrumentation and photography; lasers and masers; mechanical engineering; quality assurance and reliability; and structural mechanics.

For related information see also *Physics*.

31 ENGINEERING (GENERAL) 9

Includes vacuum technology; control engineering; display engineering; cryogenics; and fire prevention.

32 COMMUNICATIONS AND RADAR 9

Includes radar; land and global communications; communications theory; and optical communications.

For related information see also *04 Aircraft Communications and Navigation* and *17 Space Communications, Spacecraft Communications, Command and Tracking*. For search and rescue see *03 Air Transportation and Safety* and *16 Space Transportation*.

33 ELECTRONICS AND ELECTRICAL ENGINEERING 9

Includes test equipment and maintainability; components, e.g., tunnel diodes and transistors; microminiaturization; and integrated circuitry.

For related information see also *60 Computer Operations and Hardware* and *76 Solid-State Physics*.

34 FLUID MECHANICS AND HEAT TRANSFER 10

Includes boundary layers; hydrodynamics; fluidics; mass transfer and ablation cooling.

For related information see also *02 Aerodynamics* and *77 Thermodynamics and Statistical Physics*.

35 INSTRUMENTATION AND PHOTOGRAPHY 10

Includes remote sensors; measuring instruments and gages; detectors; cameras and photographic supplies; and holography.

For aerial photography see *43 Earth Resources and Remote Sensing*. For related information see also *06 Aircraft Instrumentation* and *19 Spacecraft Instrumentation*.

36 LASERS AND MASERS N.A.

Includes parametric amplifiers.

For related information see also *76 Solid-State Physics*.

37 MECHANICAL ENGINEERING 11

Includes auxiliary systems (nonpower); machine elements and processes; and mechanical equipment.

38 QUALITY ASSURANCE AND RELIABILITY N.A.

Includes product sampling procedures and techniques; and quality control.

39 STRUCTURAL MECHANICS 11

Includes structural element design and weight analysis; fatigue; and thermal stress.

For applications see *05 Aircraft Design, Testing and Performance* and *18 Spacecraft Design, Testing and Performance*.

GEOSCIENCES

Includes geosciences (general); earth resources and remote sensing; energy production and conversion; environment pollution; geophysics; meteorology and climatology; and oceanography.

For related information see also *Space Sciences*.

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43 EARTH RESOURCES AND REMOTE SENSING 13

Includes remote sensing of earth resources by aircraft and spacecraft; photogrammetry; and aerial photography.

For instrumentation see *35 Instrumentation and Photography*.

44 ENERGY PRODUCTION AND CONVERSION N.A.

Includes specific energy conversion systems, e.g., fuel cells; global sources of energy; geophysical conversion; and windpower.

For related information see also *07 Aircraft Propulsion and Power*, *20 Spacecraft Propulsion and Power*, and *28 Propellants and Fuels*.

45 ENVIRONMENT POLLUTION N.A.

Includes atmospheric, noise, thermal, and water pollution.

46 GEOPHYSICS 13

Includes aeronomy; upper and lower atmosphere studies; ionospheric and magnetospheric physics; and geomagnetism.

For space radiation see *93 Space Radiation*.

47 METEOROLOGY AND CLIMATOLOGY 14

Includes weather forecasting and modification.

48 OCEANOGRAPHY N.A.

Includes biological, dynamic, and physical oceanography; and marine resources.

For related information see also *43 Earth Resources and Remote Sensing*.

LIFE SCIENCES

Includes life sciences (general); aerospace medicine; behavioral sciences; man/system technology and life support; and space biology.

51 LIFE SCIENCES (GENERAL) 15

52 AEROSPACE MEDICINE 15

Includes physiological factors; biological effects of radiation; and effects of weightlessness on man and animals.

53 BEHAVIORAL SCIENCES 15

Includes psychological factors; individual and group behavior; crew training and evaluation; and psychiatric research.

54 MAN/SYSTEM TECHNOLOGY AND LIFE SUPPORT 16

Includes human engineering; biotechnology; and space suits and protective clothing.

For related information see also *16 Space Transportation*.

55 SPACE BIOLOGY N.A.

Includes exobiology; planetary biology; and extraterrestrial life.

MATHEMATICAL AND COMPUTER SCIENCES

Includes mathematical and computer sciences (general); computer operations and hardware; computer programming and software; computer systems; cybernetics; numerical analysis; statistics and probability; systems analysis; and theoretical mathematics.

59 MATHEMATICAL AND COMPUTER SCIENCES (GENERAL) 16

60 COMPUTER OPERATIONS AND HARDWARE 16

Includes hardware for computer graphics, firmware, and data processing.

For components see *33 Electronics and Electrical Engineering*.

61 COMPUTER PROGRAMMING AND SOFTWARE 16

Includes computer programs, routines, algorithms, and specific applications, e.g., CAD/CAM.

62 COMPUTER SYSTEMS N.A.

Includes computer networks and special application computer systems.

63 CYBERNETICS 17

Includes feedback and control theory, artificial intelligence, robotics and expert systems.

For related information see also *54 Man/System Technology and Life Support*.

64 NUMERICAL ANALYSIS N.A.

Includes iteration, difference equations, and numerical approximation.

65 STATISTICS AND PROBABILITY 17

Includes data sampling and smoothing; Monte Carlo method; and stochastic processes.

66 SYSTEMS ANALYSIS 17

Includes mathematical modeling; network analysis; and operations research.

67 THEORETICAL MATHEMATICS N.A.

Includes topology and number theory.

PHYSICS

Includes physics (general); acoustics; atomic and molecular physics; nuclear and high-energy physics; optics; plasma physics; solid-state physics; and thermodynamics and statistical physics.

For related information see also *Engineering*.

70 PHYSICS (GENERAL) N.A.

For precision time and time interval (PTTI) see *35 Instrumentation and Photography*; for geophysics, astrophysics or solar physics see *46 Geophysics*, *90 Astrophysics*, or *92 Solar Physics*.

71 ACOUSTICS 17
Includes sound generation, transmission, and attenuation.
For noise pollution see *45 Environment Pollution.*

72 ATOMIC AND MOLECULAR PHYSICS N.A.
Includes atomic structure, electron properties, and molecular spectra.

73 NUCLEAR AND HIGH-ENERGY PHYSICS 18
Includes elementary and nuclear particles; and reactor theory.
For space radiation see *93 Space Radiation.*

74 OPTICS N.A.
Includes light phenomena and optical devices.
For lasers see *36 Lasers and Masers.*

75 PLASMA PHYSICS 18
Includes magnetohydrodynamics and plasma fusion.
For ionospheric plasmas see *46 Geophysics.* For space plasmas see *90 Astrophysics.*

76 SOLID-STATE PHYSICS N.A.
Includes superconductivity.
For related information see also *33 Electronics and Electrical Engineering* and *36 Lasers and Masers.*

77 THERMODYNAMICS AND STATISTICAL PHYSICS N.A.
Includes quantum mechanics; theoretical physics; and Bose and Fermi statistics.
For related information see also *25 Inorganic and Physical Chemistry* and *34 Fluid Mechanics and Heat Transfer.*

SOCIAL SCIENCES

Includes social sciences (general); administration and management; documentation and information science; economics and cost analysis; law, political science, and space policy; and urban technology and transportation.

80 SOCIAL SCIENCES (GENERAL) N.A.
Includes educational matters.

81 ADMINISTRATION AND MANAGEMENT 18
Includes management planning and research.

82 DOCUMENTATION AND INFORMATION SCIENCE 19
Includes information management; information storage and retrieval technology; technical writing; graphic arts; and micrography.
For computer documentation see *61 Computer Programming and Software.*

83 ECONOMICS AND COST ANALYSIS N.A.
Includes cost effectiveness studies.

84 LAW, POLITICAL SCIENCE AND SPACE POLICY 19
Includes NASA appropriation hearings; aviation law; space law and policy; international law; international cooperation; and patent policy.

85 URBAN TECHNOLOGY AND TRANSPORTATION N.A.
Includes applications of space technology to urban problems; technology transfer; technology assessment; and surface and mass transportation.
For related information see *03 Air Transportation and Safety, 16 Space Transportation,* and *44 Energy Production and Conversion.*

SPACE SCIENCES

Includes space sciences (general); astronomy; astrophysics; lunar and planetary exploration; solar physics; and space radiation.
For related information see also *Geosciences.*

88 SPACE SCIENCES (GENERAL) 19

89 ASTRONOMY 19
Includes radio, gamma-ray, and infrared astronomy; and astrometry.

90 ASTROPHYSICS 20
Includes cosmology; celestial mechanics; space plasmas; and interstellar and interplanetary gases and dust.
For related information see also *75 Plasma Physics.*

91 LUNAR AND PLANETARY EXPLORATION 21
Includes planetology; and manned and unmanned flights.
For spacecraft design or space stations see *18 Spacecraft Design, Testing and Performance.*

92 SOLAR PHYSICS 21
Includes solar activity; solar flares, solar radiation and sunspots.
For related information see *93 Space Radiation.*

93 SPACE RADIATION N.A.
Includes cosmic radiation; and inner and outer earth's radiation belts.
For biological effects of radiation see *52 Aerospace Medicine.* For theory see *73 Nuclear and High-Energy Physics.*

GENERAL

Includes aeronautical, astronautical, and space science related histories, biographies, and pertinent reports too broad for categorization; histories or broad overviews of NASA programs.

99 GENERAL 21

Note: N.A. means that no abstracts were assigned to this category for this issue.

SUBJECT INDEX A-1
PERSONAL AUTHOR INDEX B-1
REPORT NUMBER INDEX C-1

01

AERONAUTICS (GENERAL)

N88-14926*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
LANGLEY SYMPOSIUM ON AERODYNAMICS, VOLUME 1
SHARON H. STACK, comp. Dec. 1986 592 p Symposium held in Hampton, Va., 23-25 Apr. 1985
(NASA-CP-2397; L-16031; NAS 1.55:2397) Avail: NTIS HC A25/MF A01 CSCL 01B
AERODYNAMIC CONFIGURATIONS, AIRCRAFT DESIGN, AIRCRAFT MANEUVERS, COMPUTATIONAL FLUID DYNAMICS, CONFERENCES

N88-16625*# National Aeronautics and Space Administration, Washington, D.C.
NASA/ARMY ROTORCRAFT TECHNOLOGY. VOLUME 1: AERODYNAMICS, AND DYNAMICS AND AEROELASTICITY
Feb. 1988 537 p Conference held at Moffett Field, Calif., 17-19 Mar. 1987
(NASA-CP-2495-VOL-1; NAS 1.55:2495-VOL-1) Avail: NTIS HC A23/MF A01 CSCL 01B
AEROELASTICITY, COMPUTATIONAL FLUID DYNAMICS, CONFERENCES, FLIGHT CONTROL, HELICOPTERS, ROTOR AERODYNAMICS

N88-16632*# National Aeronautics and Space Administration, Washington, D.C.
NASA/ARMY ROTORCRAFT TECHNOLOGY. VOLUME 2: MATERIALS AND STRUCTURES, PROPULSION AND DRIVE SYSTEMS, FLIGHT DYNAMICS AND CONTROL, AND ACOUSTICS
Feb. 1988 587 p Conference held at Moffett Field, Calif., 17-19 Mar. 1987
(NASA-CP-2495-VOL-2; NAS 1.55:2495-VOL-2) Avail: NTIS HC A25/MF A01 CSCL 01B
AEROACOUSTICS, AIRCRAFT DESIGN, CONFERENCES, CONTROLLABILITY, ENGINE DESIGN, FRACTURE MECHANICS, HELICOPTERS, ROTOR AERODYNAMICS

N88-16650*# National Aeronautics and Space Administration, Washington, D.C.
NASA/ARMY ROTORCRAFT TECHNOLOGY. VOLUME 3: SYSTEMS INTEGRATION, RESEARCH AIRCRAFT, AND INDUSTRY
Feb. 1988 387 p Conference held at Moffett Field, Calif., 17-19 Mar. 1987
(NASA-CP-2495-VOL-3; NAS 1.55:2495-VOL-3) Avail: NTIS HC A17/MF A01 CSCL 01B
AIRCRAFT DESIGN, FLIGHT TESTS, HELICOPTER PERFORMANCE, ROTARY WING AIRCRAFT, SYSTEMS INTEGRATION

N88-19407*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
GENERAL EQUILIBRIUM CHARACTERISTICS OF A DUAL-LIFT HELICOPTER SYSTEM
L. S. CICOLANI and G. KANNING Jul. 1986 86 p
(NASA-TP-2615; A-86114; NAS 1.60:2615) Avail: NTIS HC A05/MF A01 CSCL 01B
CARGO AIRCRAFT, EQUILIBRIUM, HEAVY LIFT HELICOPTERS, SUSPENDING (HANGING), TETHERING

N88-23715*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
JOINT UNIVERSITY PROGRAM FOR AIR TRANSPORTATION RESEARCH, 1986
FREDERICK R. MORRELL, comp. Apr. 1988 115 p Meeting held in Hampton, Va., 8-9 Jan. 1987; sponsored by NASA, Langley Research Center, Hampton, Va. and FAA, Washington, D.C. Sponsored by NASA, Washington
(NASA-CP-2502; L-16406; NAS 1.55:2502) Avail: NTIS HC A06/MF A01 CSCL 01B
AERODYNAMICS, AIRCRAFT CONTROL, AIRCRAFT GUIDANCE, AVIONICS, SURFACE NAVIGATION

N88-27148*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
INTEGRATED TECHNOLOGY ROTOR METHODOLOGY ASSESSMENT WORKSHOP
MICHAEL J. MCNULTY, ed. and WILLIAM G. BOUSMAN, ed. Jun. 1988 381 p Workshop held in Moffett Field, Calif., 21-22 Jun. 1983; sponsored by NASA, Ames Research Center and the Army Prepared in cooperation with Army Aviation Systems Command, Moffett Field, Calif. Sponsored by NASA, Washington, D.C.
(NASA-CP-10007; A-86381; NAS 1.55:10007; USAAVSCOM-CP-88-A-001) Avail: NTIS HC A17/MF A01 CSCL 01B
AERODYNAMIC STABILITY, AEROELASTICITY, CONFERENCES, MATHEMATICAL MODELS, ROTOR AERODYNAMICS, ROTOR BODY INTERACTIONS

N88-27163* National Aeronautics and Space Administration, Washington, D.C.
AERONAUTICAL ENGINEERING: A CONTINUING BIBLIOGRAPHY WITH INDEXES
Aug. 1988 126 p
(NASA-SP-7037(229); NAS 1.21:7037(229)) Avail: NTIS HC A07 CSCL 01B
This bibliography lists 455 reports, articles, and other documents introduced into the NASA scientific and technical information system in July, 1988. Author

02

AERODYNAMICS

Includes aerodynamics of bodies, combinations, wings, rotors, and control surfaces; and internal flow in ducts and turbomachinery.

N88-10099*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
WIND-TUNNEL INVESTIGATION OF A FULL-SCALE GENERAL AVIATION AIRPLANE EQUIPPED WITH AN ADVANCED NATURAL LAMINAR FLOW WING
DANIEL G. MURRI and FRANK L. JORDAN, JR. Nov. 1987 136 p
(NASA-TP-2772; L-16283; NAS 1.60:2772) Avail: NTIS HC A07/MF A01 CSCL 01A
GENERAL AVIATION AIRCRAFT, LAMINAR FLOW AIRFOILS, WIND TUNNEL TESTS, WINGS

N88-10765*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
COMPARISON OF WIND TUNNEL AND FLIGHT TEST AFTERBODY AND NOZZLE PRESSURES FOR A TWIN-JET FIGHTER AIRCRAFT AT TRANSONIC SPEEDS
JACK NUGENT and ODIS C. PENDERGRAFT, JR. Mar. 1987 125 p
(NASA-TP-2588; H-1214; NAS 1.60:2588) Avail: NTIS HC A06/MF A01 CSCL 01A
AFTERBODIES, FIGHTER AIRCRAFT, FLIGHT TESTS, NOZZLE THRUST COEFFICIENTS, TRANSONIC SPEED, WIND TUNNEL MODELS, WIND TUNNEL TESTS

N88-10771*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
EFFECT OF EMPENNAGE ARRANGEMENT ON SINGLE-ENGINE NOZZLE/AFTERBODY STATIC PRESSURES AT TRANSONIC SPEEDS
WILLIAM P. HENDERSON and JAMES R. BURLEY, II Nov. 1987 230 p
(NASA-TP-2753; L-16223; NAS 1.60:2753) Avail: NTIS HC A11/MF A01 CSCL 01A
AFTERBODIES, AXISYMMETRIC FLOW, JET AIRCRAFT, JET ENGINES, NOZZLES, STATIC PRESSURE, TAIL ASSEMBLIES, TRANSONIC SPEED

N88-12454*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
PLANFORM EFFECTS ON THE SUPERSONIC AERODYNAMICS OF MULTIBODY CONFIGURATIONS
NAOMI MCMILLIN and RICHARD M. WOOD 1987 138 p
(NASA-TP-2762; L-16312; NAS 1.60:2762) Avail: NTIS HC A07/MF A01 CSCL 01A
AERODYNAMIC CHARACTERISTICS, AERODYNAMIC DRAG, AIRCRAFT CONFIGURATIONS, FINENESS RATIO, PLANFORMS, SUPERSONICS, ZERO LIFT

N88-12455* National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
EFFECTS OF THE INSTALLATION AND OPERATION OF JET-EXHAUST YAW VANES ON THE LONGITUDINAL AND LATERAL-DIRECTIONAL CHARACTERISTICS OF THE F-14 AIRPLANE
DAVID E. REUBUSH and BOBBY L. BERRIER Dec. 1987 121 p
(NASA-TP-2769; L-16302; NAS 1.60:2769) Avail: NTIS HC A06/MF A01 CSCL 01A
AERODYNAMIC STABILITY, AIRCRAFT CONTROL, DIRECTIONAL STABILITY, F-14 AIRCRAFT, JET VANES, LATERAL STABILITY, LONGITUDINAL STABILITY, THRUST VECTOR CONTROL, WIND TUNNEL STABILITY TESTS

N88-16862*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
A SIMPLIFIED APPROACH TO AXISYMMETRIC DUAL-REFLECTOR ANTENNA DESIGN
RAYMOND L. BARGER Mar. 1988 14 p
(NASA-TP-2797; L-16392; NAS 1.60:2797) Avail: NTIS HC A03/MF A01 CSCL 20N
REFLECTORS, STIMULATED EMISSION, ANTENNA DESIGN, ANTENNA RADIATION PATTERNS, REFLECTOR ANTENNAS

N88-17586*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
PROCEEDINGS OF THE CIRCULATION-CONTROL WORKSHOP, 1985
JACK N. NIELSEN, comp. May 1987 591 p Workshop held at Moffett Field, Calif., 19-21 Feb. 1986 Original contains color illustrations
(NASA-CP-2432; A-86314; NAS 1.55:2432) Avail: NTIS HC A25/MF A01 CSCL 01A
AIRCRAFT CONTROL, CIRCULATION CONTROL AIRFOILS, CIRCULATION CONTROL ROTORS, COANDA EFFECT, X WING ROTORS

N88-17614*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
A TRANSONIC-SMALL-DISTURBANCE WING DESIGN METHODOLOGY
PAMELA S. PHILLIPS, EDGAR G. WAGGONER, and RICHARD L. CAMPBELL Mar. 1988 32 p
(NASA-TP-2806; L-16393; NAS 1.60:2806) Avail: NTIS HC A03/MF A01 CSCL 01A
CODING, COMPUTER PROGRAMS, DESIGN ANALYSIS, SMALL PERTURBATION FLOW, TRANSONIC FLOW, WINGS

N88-17615*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
SUPERSONIC AERODYNAMICS OF DELTA WINGS
RICHARD M. WOOD Mar. 1988 106 p
(NASA-TP-2771; L-16212; NAS 1.60:2771) Avail: NTIS HC A06/MF A01 CSCL 01A
AERODYNAMICS, DELTA WINGS, INVISCID FLOW, SUPERSONIC AIRFOILS, SUPERSONIC SPEED

N88-18552*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
A PERFORMANCE INDEX APPROACH TO AERODYNAMIC DESIGN WITH THE USE OF ANALYSIS CODES ONLY
RAYMOND L. BARGER and ANUTOSH MOITRA (High Technology Corp., Hampton, Va.) Mar. 1988 21 p
(NASA-TP-2805; L-16379; NAS 1.60:2805) Avail: NTIS HC A03/MF A01 CSCL 01A
AERODYNAMIC CONFIGURATIONS, CODING, COMPUTER PROGRAMS, DESIGN ANALYSIS, INDEXES (DOCUMENTATION), PERFORMANCE TESTS

N88-18567*# National Aeronautics and Space Administration. Hugh L. Dryden Flight Research Center, Edwards, Calif.
EFFECTS OF WINGLETS ON A FIRST-GENERATION JET TRANSPORT WING. 7: SIDESLIP EFFECTS ON WINGLET LOADS AND SELECTED WING LOADS AT SUBSONIC SPEEDS FOR A FULL-SPAN MODEL
ROBERT R. MEYER, JR. and PETER F. COVELL Sep. 1986 60 p
(NASA-TP-2619; H-1193; NAS 1.60:2619) Avail: NTIS HC A04/MF A01 CSCL 01A
SIDESLIP, SUBSONIC SPEED, WIND TUNNEL MODELS, WINGLETS

N88-19412*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
TRAJECTORY CHARACTERISTICS AND HEATING OF HYPERVELOCITY PROJECTILES HAVING LARGE BALLISTIC COEFFICIENTS

MICHAEL E. TAUBER Aug. 1986 21 p
(NASA-TP-2614; A-86187; NAS 1.60:2614) Avail: NTIS HC A03/MF A01 CSCL 01A
AERODYNAMIC HEATING, BALLISTIC TRAJECTORIES, HYPERVELOCITY PROJECTILES, TRAJECTORY ANALYSIS

N88-19416* National Aeronautics and Space Administration, Washington, D.C.
AERONAUTICAL ENGINEERING: A CUMULATIVE INDEX TO A CONTINUING BIBLIOGRAPHY
Jan. 1988 499 p
(NASA-SP-7037(222); NAS 1.21:7037(222)) Avail: NTIS HC $14.50 domestic, $29.00 foreign CSCL 01A
This bibliography is a cumulative index to the abstracts contained in NASA SP-7037(210) through NASA SP-7037(221) of Aeronautical Engineering: A Continuing Bibliography. NASA SP-7037 and its supplements have been compiled through the cooperative efforts of the American Institute of Aeronautics and Astronautics (AIAA) and the National Aeronautics and Space Administration (NASA). This cumulative index includes subject, personal author, corporate source, foreign technology, contract number, report number, and accession number indexes. Author

N88-19420*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
AERODYNAMIC CHARACTERISTICS OF WINGS DESIGNED WITH A COMBINED-THEORY METHOD TO CRUISE AT A MACH NUMBER OF 4.5
ROBERT J. MACK Apr. 1988 60 p Sponsored by NASA, Washington
(NASA-TP-2799; L-16333; NAS 1.60:2799) Avail: NTIS HC A04/MF A01 CSCL 01A
AERODYNAMIC CHARACTERISTICS, AIRCRAFT DESIGN, CAMBERED WINGS, DESIGN ANALYSIS, HYPERSONIC SPEED, SUPERSONIC SPEED

N88-20257*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
AN EXPERIMENTAL INVESTIGATION OF THE FLAP-LAG-TORSION AEROELASTIC STABILITY OF A SMALL-SCALE HINGELESS HELICOPTER ROTOR IN HOVER
DAVID L. SHARPE Jan. 1988 86 p Prepared in cooperation with Army Aviation Research and Development Command, Moffett Field, Calif.
(NASA-TP-2546; REPT-85142; NAS 1.60:2546; AVSCOM-TR-85-A-9) Avail: NTIS HC A05/MF A01 CSCL 01A
AEROELASTICITY, FLAPS (CONTROL SURFACES), HELICOPTERS, HOVERING, RIGID ROTORS, STABILITY, TORSION

N88-20264*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
A REVIEW OF TECHNOLOGIES APPLICABLE TO LOW-SPEED FLIGHT OF HIGH-PERFORMANCE AIRCRAFT INVESTIGATED IN THE LANGLEY 14- X 22-FOOT SUBSONIC TUNNEL
JOHN W. PAULSON, JR., P. FRANK QUINTO, DANIEL W. BANKS, GUY T. KEMMERLY, and GREGORY M. GATLIN May 1988 94 p
(NASA-TP-2796; L-16364; NAS 1.60:2796) Avail: NTIS HC A05/MF A01 CSCL 01A
AERODYNAMIC CONFIGURATIONS, FLIGHT TESTS, LOW SPEED, RESEARCH FACILITIES, SHORT TAKEOFF AIRCRAFT, TECHNOLOGY ASSESSMENT, V/STOL AIRCRAFT, WIND TUNNEL TESTS

N88-20280*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
STATIC PERFORMANCE OF AN AXISYMMETRIC NOZZLE WITH POST-EXIT VANES FOR MULTIAXIS THRUST VECTORING
BOBBY L. BERRIER and MARY L. MASON May 1988 54 p
(NASA-TP-2800; L-16371; NAS 1.60:2800) Avail: NTIS HC A04/MF A01 CSCL 01A
AXISYMMETRIC BODIES, CONVERGENT-DIVERGENT NOZZLES, STATIC TESTS, THRUST VECTOR CONTROL, VANES

N88-21117*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
THE NASA LANGLEY LAMINAR-FLOW-CONTROL (LFC) EXPERIMENT ON A SWEPT, SUPERCRITICAL AIRFOIL: DESIGN OVERVIEW
CHARLES D. HARRIS, WILLIAM D. HARVEY, and CUYLER W. BROOKS, JR. May 1988 126 p
(NASA-TP-2809; L-16324; NAS 1.60:2809) Avail: NTIS HC A07/MF A01 CSCL 01A
BOUNDARY LAYER CONTROL, LAMINAR BOUNDARY LAYER, LAMINAR FLOW, SUPERCRITICAL AIRFOILS, SWEPT WINGS

N88-21118*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
STATIC PERFORMANCE OF NONAXISYMMETRIC NOZZLES WITH YAW THRUST-VECTORING VANES
MARY L. MASON and BOBBY L. BERRIER May 1988 79 p
(NASA-TP-2813; L-16389; NAS 1.60:2813) Avail: NTIS HC A05/MF A01 CSCL 01A
CONVERGENT NOZZLES, CONVERGENT-DIVERGENT NOZZLES, STATIC TESTS, STATIC THRUST, THRUST VECTOR CONTROL

N88-23735*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
NUMERICAL SIMULATION OF SCRAMJET INLET FLOW FIELDS
AJAY KUMAR May 1988 29 p
(NASA-TP-2517; L-16000; NAS 1.60:2517) Avail: NTIS HC A03/MF A01 CSCL 01A
APPLICATIONS PROGRAMS (COMPUTERS), COMPUTATIONAL FLUID DYNAMICS, INLET FLOW, NAVIER-STOKES EQUATION, SUPERSONIC COMBUSTION RAMJET ENGINES, THREE DIMENSIONAL FLOW, TURBULENT FLOW

N88-23737*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
LAMINAR FLOW AIRCRAFT CERTIFICATION
LOUIS J. WILLIAMS, comp. May 1988 325 p Workshop held in Wichita, Kans., 15-16 Apr. 1985; sponsored by NASA, AIAA, SAE and FAA Sponsored by NASA, Washington
(NASA-CP-2413; L-16111; NAS 1.55:2413) Avail: NTIS HC A14/MF A01 CSCL 01A
AIRCRAFT DESIGN, CERTIFICATION, CONFERENCES, LAMINAR FLOW, LAMINAR FLOW AIRFOILS

N88-23757*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
AEROPROPULSIVE CHARACTERISTICS OF ISOLATED COMBINED TURBOJET/RAMJET NOZZLES AT MACH NUMBERS FROM 0 TO 1.20
GEORGE T. CARSON, JR. and MILTON LAMB Jun. 1988 174 p
(NASA-TP-2814; L-16390; NAS 1.60:2814) Avail: NTIS HC A08/MF A01 CSCL 01A
MACH NUMBER, NOZZLE EFFICIENCY, NOZZLE GEOMETRY, RAMJET ENGINES, ROCKET NOZZLES, TURBINE ENGINES

N88-23760*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
SENSITIVITY OF F-106B LEADING-EDGE-VORTEX IMAGES TO FLIGHT AND VAPOR-SCREEN PARAMETERS
JOHN E. LAMAR and THOMAS D. JOHNSON, JR. (Planning Research Corp., Hampton, Va.) Jun. 1988 80 p Original contains color illustrations
(NASA-TP-2818; L-16395; NAS 1.60:2818) Avail: NTIS HC A05/MF A01 CSCL 01A

F-106 AIRCRAFT, IMAGE PROCESSING, LEADING EDGES, SCREEN EFFECT, TRANSONIC FLIGHT, VAPORS, VORTICES, WINGS

N88-28895*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
STEADY AND UNSTEADY TRANSONIC PRESSURE MEASUREMENTS ON A CLIPPED DELTA WING FOR PITCHING AND CONTROL-SURFACE OSCILLATIONS
ROBERT W. HESS, F. W. CAZIER, JR., and ELEANOR C. WYNNE Washington, D.C. Oct. 1988 118 p MF as supplement
(NASA-TP-2594; L-16082; NAS 1.60:2594) Avail: NTIS HC A06/MF A01 CSCL 01A
CONTROL SURFACES, DELTA WINGS, LONGITUDINAL CONTROL, OSCILLATIONS, PRESSURE MEASUREMENT, STEADY STATE, WIND TUNNEL TESTS

N88-29752*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
AERODYNAMICS IN GROUND EFFECT AND PREDICTED LANDING GROUND ROLL OF A FIGHTER CONFIGURATION WITH A SECONDARY-NOZZLE THRUST REVERSER
DANIEL W. BANKS Oct. 1988 131 p
(NASA-TP-2834; L-16435; NAS 1.60:2834) Avail: NTIS HC A07/MF A01 CSCL 01A
CASCADE FLOW, GROUND EFFECT (AERODYNAMICS), NOZZLE FLOW, ROLL, SHORT TAKEOFF AIRCRAFT, THRUST REVERSAL

03

AIR TRANSPORTATION AND SAFETY

Includes passenger and cargo air transport operations; and aircraft accidents.

N88-14970*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
WIND SHEAR DETECTION. FORWARD-LOOKING SENSOR TECHNOLOGY
E. M. BRACALENTE, comp. and V. E. DELNORE, comp. (PRC Kentron, Inc., Hampton, Va.) Oct. 1987 282 p Presented at the 1st Industry Review, Hampton, Va., 24-25 Feb. 1987
(NASA-CP-10004; NAS 1.55:10004; DOT/FAA/PS-87/2) Avail: NTIS HC A13/MF A01 CSCL 01C
AEROSPACE INDUSTRY, CONFERENCES, DOPPLER RADAR, FLIR DETECTORS, REMOTE SENSING, WIND SHEAR

N88-17616*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
AIRBORNE WIND SHEAR DETECTION AND WARNING SYSTEMS: FIRST COMBINED MANUFACTURERS' AND TECHNOLOGISTS' CONFERENCE
AMOS A. SPADY, JR., comp., ROLAND L. BOWLES, comp., and HERBERT SCHLICKENMAIER, comp. (Federal Aviation Administration, Washington, D.C.) Jan. 1988 558 p Conference held in Hampton, Va., 22-23 Oct. 1987
(NASA-CP-10006; NAS 1.55:10006; DOT/FAA/PS-88/7) Avail: NTIS HC A24/MF A01 CSCL 01C
AIRBORNE EQUIPMENT, AIRCRAFT CONTROL, CONFERENCES, DETECTION, DOPPLER RADAR, INFORMATION TRANSFER, OPTICAL RADAR, WARNING SYSTEMS, WIND SHEAR

N88-21144*# National Aeronautics and Space Administration. Wallops Flight Center, Wallops Island, Va.
INVESTIGATION OF THE MISFUELING OF RECIPROCATING PISTON AIRCRAFT ENGINES
J. HOLLAND SCOTT, JR. Mar. 1988 82 p
(NASA-TP-2803; NAS 1.60:2803) Avail: NTIS HC A05/MF A01 CSCL 01C
AIRCRAFT ENGINES, ERRORS, GENERAL AVIATION AIRCRAFT, PISTON ENGINES, REFUELING

N88-26344*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
INFLUENCE OF WIND SHEAR ON THE AERODYNAMIC CHARACTERISTICS OF AIRPLANES
DAN D. VICROY Aug. 1988 62 p Sponsored by NASA, Washington, D.C. and DOT, Washington, D.C.
(NASA-TP-2827; L-16439; NAS 1.60:2827; DOT/FAA/PS-88/15) Avail: NTIS HC A04/MF A01 CSCL 01C
AERODYNAMIC CHARACTERISTICS, AIRCRAFT CONTROL, MICROBURSTS (METEOROLOGY), SHEAR FLOW, WIND SHEAR

05

AIRCRAFT DESIGN, TESTING AND PERFORMANCE

Includes aircraft simulation technology.

N88-12480*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
EFFECT OF MOTION CUES DURING COMPLEX CURVED APPROACH AND LANDING TASKS: A PILOTED SIMULATION STUDY
CHARLES H. SCANLON (Arkansas State Univ., State University.) Dec. 1987 28 p
(NCC1-107)
(NASA-TP-2773; L-16351; NAS 1.60:2773) Avail: NTIS HC A03/MF A01 CSCL 01C
APPROACH, CUES, LANDING, MICROWAVE LANDING SYSTEMS, MOTION, PILOT PERFORMANCE, TRACKING (POSITION), WORKLOADS (PSYCHOPHYSIOLOGY)

N88-19583*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
CORNERING CHARACTERISTICS OF THE MAIN-GEAR TIRE OF THE SPACE SHUTTLE ORBITER
ROBERT H. DAUGHERTY, SANDY M. STUBBS, and MARTHA P. ROBINSON Mar. 1988 29 p
(NASA-TP-2790; L-16370; NAS 1.60:2790) Avail: NTIS HC A03/MF A01 CSCL 01C
AERODYNAMIC LOADS, COEFFICIENTS, LANDING GEAR, SPACE SHUTTLES, TIRES, YAWING MOMENTS

N88-19467*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
A PERSPECTIVE ON 15 YEARS OF PROOF-OF-CONCEPT AIRCRAFT DEVELOPMENT AND FLIGHT RESEARCH AT AMES-MOFFETT BY THE ROTORCRAFT AND POWERED-LIFT FLIGHT PROJECTS DIVISION, 1970-1985
DAVID D. FEW Aug. 1987 55 p
(NASA-RP-1187; A-86404; NAS 1.61:1187) Avail: NTIS HC A04/MF A01 CSCL 01C
A proof-of-concept (POC) aircraft is defined and the concept of interest described for each of the six aircraft developed by the Ames-Moffet Rotorcraft and Powered-Lift Flight Projects Division from 1970 through 1985; namely, the OV-10, the C-8A Augmentor Wing, the Quiet Short-Haul Research Aircraft (QSRA), the XV-15 Tilt Rotor Research Aircraft (TRRA), the Rotor Systems Research Aircraft (RSRA)-compound, and the yet-to-fly RSRA/X-Wing Aircraft. The program/project chronology and most noteworthy features of the concepts are reviewed. The paper discusses the significance of each concept and the project demonstrating it; it briefly looks at what concepts are on the horizon as potential

POC research aircraft and emphasizes that no significant advanced concept in aviation technology has ever been accepted by civilian or military users without first completing a demonstration through flight testing. Author

N88-21153*# National Aeronautics and Space Administration. Hugh L. Dryden Flight Research Center, Edwards, Calif.
DEVELOPMENT AND FLIGHT TEST OF AN EXPERIMENTAL MANEUVER AUTOPILOT FOR A HIGHLY MANEUVERABLE AIRCRAFT
EUGENE L. DUKE, FRANK P. JONES, and RALPH B. RONCOLI Sep. 1986 61 p
(NASA-TP-2618; H-1258; NAS 1.60:2618) Avail: NTIS HC A04/MF A01 CSCL 01C
AUTOMATIC CONTROL, AUTOMATIC PILOTS, FLIGHT TESTS, HIGHLY MANEUVERABLE AIRCRAFT

N88-21157*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
STATIC MECHANICAL PROPERTIES OF 30 X 11.5 - 14.5, TYPE 8 AIRCRAFT TIRES OF BIAS-PLY AND RADIAL-BELTED DESIGN
PAMELA A. DAVIS and MERCEDES C. LOPEZ May 1988 24 p
(NASA-TP-2810; L-16374; NAS 1.60:2810) Avail: NTIS HC A03/MF A01 CSCL 01C
AIRCRAFT TIRES, MECHANICAL PROPERTIES, STATIC TESTS

N88-22031*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
SHAPE SENSITIVITY ANALYSIS OF WING STATIC AEROELASTIC CHARACTERISTICS
JEAN-FRANCOIS M. BARTHELEMY and FRED D. BERGEN (Virginia Polytechnic Inst. and State Univ., Blacksburg.) May 1988 30 p
(NASA-TP-2808; L-16418; NAS 1.60:2808) Avail: NTIS HC A03/MF A01 CSCL 01C
AEROELASTICITY, DYNAMIC RESPONSE, SENSITIVITY, WING LOADING, WING PROFILES

N88-24623*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
NONLINEAR PROGRAMMING EXTENSIONS TO RATIONAL FUNCTION APPROXIMATION METHODS FOR UNSTEADY AERODYNAMIC FORCES
SHERWOOD H. TIFFANY and WILLIAM M. ADAMS, JR. Jul. 1988 55 p Previously announced in IAA as A87-33694 Sponsored by NASA, Washington
(NASA-TP-2776; L-16205; NAS 1.60:2776) Avail: NTIS HC A04/MF A01 CSCL 01C
AERODYNAMIC FORCES, AERODYNAMICS, APPROXIMATION, EQUATIONS OF MOTION, FLEXIBLE BODIES, NONLINEAR PROGRAMMING, OPTIMIZATION

06

AIRCRAFT INSTRUMENTATION

Includes cockpit and cabin display devices; and flight instruments.

N88-12487*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
EFFECTS OF COMBINING VERTICAL AND HORIZONTAL INFORMATION INTO A PRIMARY FLIGHT DISPLAY
TERENCE S. ABBOTT, MARK NATAUPSKY, and GEORGE G. STEINMETZ Dec. 1987 21 p
(NASA-TP-2783; L-16366; NAS 1.60:2783) Avail: NTIS HC A03/MF A01 CSCL 01D
COCKPITS, CONSOLIDATION, DISPLAY DEVICES, HORIZONTAL ORIENTATION, POSITION INDICATORS, VERTICAL ORIENTATION

07

AIRCRAFT PROPULSION AND POWER

Includes prime propulsion systems and systems components, e.g., gas turbine engines and compressors; and onboard auxiliary power plants for aircraft.

N88-15785*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
AEROPROPULSION '87. SESSION 2: AEROPROPULSION STRUCTURES RESEARCH
Nov. 1987 52 p Conference held in Cleveland, Ohio, 17-19 Nov. 1987 Submitted for publication
(NASA-CP-10003-SESS-2; E-3798-SESS-2; NAS 1.55:10003-SESS-2) Avail: NTIS HC A04/MF A01 CSCL 21E
CONTROL SYSTEMS DESIGN, DESIGN ANALYSIS, PROPULSION SYSTEM CONFIGURATIONS, STRUCTURAL ANALYSIS

N88-15790*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
AEROPROPULSION '87. SESSION 3: INTERNAL FLUID MECHANICS RESEARCH
Nov. 1987 75 p Conference held in Cleveland, Ohio, 17-19 Nov. 1987 Submitted for publication
(NASA-CP-10003-SESS-3; E-3798-SESS-3; NAS 1.55:10003-SESS-3) Avail: NTIS HC A04/MF A01 CSCL 21E
CHEMICAL REACTIONS, DUCTS, FLUID MECHANICS, INLET FLOW, NOZZLES, PREDICTION ANALYSIS TECHNIQUES, PROPULSION, TURBOMACHINERY

N88-15794*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
AEROPROPULSION '87. SESSION 4: INSTRUMENTATION AND CONTROLS RESEARCH
Nov. 1987 77 p Conference held in Cleveland, Ohio, 17-19 Nov. 1987 Submitted for publication
(NASA-CP-10003-SESS-4; E-3798-SESS-4; NAS 1.55:10003-SESS-4) Avail: NTIS HC A05/MF A01 CSCL 21E
CONFERENCES, CONTROL SYSTEMS DESIGN, FIBER OPTICS, FLUID MECHANICS, MEASURING INSTRUMENTS, PROPULSION

N88-15800*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
AEROPROPULSION '87. SESSION 5: SUBSONIC PROPULSION TECHNOLOGY
Nov. 1987 153 p Conference held in Cleveland, Ohio, 17-19 Nov. 1987 Submitted for publication
(NASA-CP-10003-SESS-5; E-3798-SESS-5; NAS 1.55:10003-SESS-5) Avail: NTIS HC A08/MF A01 CSCL 21E
CONFERENCES, ENGINE DESIGN, FLUID MECHANICS, PROP-FAN TECHNOLOGY, PROPULSION

N88-15807*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
AEROPROPULSION '87. SESSION 6: HIGH-SPEED PROPULSION TECHNOLOGY
Nov. 1987 119 p Conference held in Cleveland, Ohio, 17-19 Nov. 1987 Submitted for publication
(NASA-CP-10003-SESS-6; E-3798-SESS-6; NAS 1.55:10003-SESS-6) Avail: NTIS HC A06/MF A01 CSCL 21E
CONFERENCES, FLUID MECHANICS, HYPERSONIC AIRCRAFT, PROPULSION SYSTEM CONFIGURATIONS,

SUPERSONIC AIRCRAFT, SUPERSONIC COMBUSTION RAMJET ENGINES, TRANSPORT AIRCRAFT

N88-16697*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
AEROPROPULSION '87. SESSION 1: AEROPROPULSION MATERIALS RESEARCH
Nov. 1987 121 p Conference held in Cleveland, Ohio, 17-19 Nov. 1987 Submitted for publication
(NASA-CP-10003-SESS-1; E-3798-SESS-1; NAS 1.55:10003-SESS-1) Avail: NTIS HC A06/MF A01 CSCL 21E
CERAMICS, CREEP PROPERTIES, ENGINE DESIGN, ENGINE PARTS, FATIGUE (MATERIALS), METAL MATRIX COMPOSITES, POLYMER MATRIX COMPOSITES

08

AIRCRAFT STABILITY AND CONTROL

Includes aircraft handling qualities; piloting; flight controls; and autopilots.

N88-14987*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
HANDLING QUALITIES OF A WIDE-BODY TRANSPORT AIRPLANE UTILIZING PITCH ACTIVE CONTROL SYSTEMS (PACS) FOR RELAXED STATIC STABILITY APPLICATION
WILLIAM D. GRANTHAM, LEE H. PERSON, JR., PHILIP W. BROWN, LAWRENCE E. BECKER, GEORGE E. HUNT, J. J. RISING, W. J. DAVIS, C. S. WILLEY, W. A. WEAVER, and R. COKELEY Dec. 1985 109 p
(NASA-TP-2482; L-15928; NAS 1.60:2482) Avail: NTIS HC A06/MF A01 CSCL 01C
ACTIVE CONTROL, FLIGHT CHARACTERISTICS, FLIGHT SIMULATION, PITCH (INCLINATION), STATIC STABILITY, TRANSPORT AIRCRAFT

N88-19475*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
ROTORCRAFT FLIGHT-PROPULSION CONTROL INTEGRATION: AN ECLECTIC DESIGN CONCEPT
JAMES R. MIHALOEW, MARK G. BALLIN, and D. C. G. RUTTLEDGE (Sikorsky Aircraft, Stratford, Conn.) Apr. 1988 34 p
(NASA-TP-2815; E-3812; NAS 1.60:2815) Avail: NTIS HC A03/MF A01 CSCL 01C
AIRCRAFT CONTROL, DESIGN ANALYSIS, INTEGRATORS, PROPULSIVE EFFICIENCY, ROTARY WING AIRCRAFT

09

RESEARCH AND SUPPORT FACILITIES (AIR)

Includes airports, hangars and runways; aircraft repair and overhaul facilities; wind tunnels; shock tubes; and aircraft engine test stands.

N88-17686*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
EXPERIMENTAL EVALUATION OF TURNING VANE DESIGNS FOR HIGH-SPEED AND COUPLED FAN-DRIVE CORNERS OF 0.1-SCALE MODEL OF NASA LEWIS RESEARCH CENTER'S PROPOSED ALTITUDE WIND TUNNEL
THOMAS F. GELDER, ROYCE D. MOORE, RICKEY J. SHYNE, and DONALD R. BOLDMAN May 1987 54 p Microfiche available as supplement
(NASA-TP-2681; E-3218; NAS 1.60:2681) Avail: NTIS HC A04/MF A01 CSCL 14B
ALTITUDE SIMULATION, CORNER FLOW, COUPLING, GUIDE VANES, HIGH SPEED, WIND TUNNEL APPARATUS, WIND TUNNEL DRIVES

N88-28075*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
FINITE-RATE WATER CONDENSATION IN COMBUSTION-HEATED WIND TUNNELS
WAYNE D. ERICKSON, GERALD H. MALL, and RAMADAS K. PRABHU (PRC Systems Services Co., Hampton, Va.) Sep. 1988 76 p
(NASA-TP-2833; L-16443; NAS 1.60:2833) Avail: NTIS HC A05/MF A01 CSCL 14B
COMBUSTION PRODUCTS, COMBUSTION WIND TUNNELS, CONDENSING, HIGH TEMPERATURE ENVIRONMENTS, NUCLEATION, WATER

12

ASTRONAUTICS (GENERAL)

N88-17691*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
THE 1987 GET AWAY SPECIAL EXPERIMENTER'S SYMPOSIUM
NEAL BARTHELME, ed. and FRANCES L. MOSIER, ed. (RMS Technologies, Inc., Landover, Md.) Feb. 1988 169 p Symposium held in Greenbelt, Md., 27-28 Oct. 1987
(NASA-CP-2500; REPT-88B0049; NAS 1.55:2500) Avail: NTIS HC A08/MF A01 CSCL 22A
GET AWAY SPECIALS (STS), MISSION PLANNING, PROJECT PLANNING, SPACE SHUTTLE MISSIONS, SPACE STATIONS

N88-27214* National Aeronautics and Space Administration, Washington, D.C.
TECHNOLOGY FOR LARGE SPACE SYSTEMS: A BIBLIOGRAPHY WITH INDEXES (SUPPLEMENT 18)
Jun. 1988 162 p
(NASA-SP-7046(18); NAS 1.21:7046(18)) Avail: NTIS HC A07 CSCL 22B
This bibliography lists 569 reports, articles, and other documents introduced into the NASA scientific and technical information system between July 1,1987 and December 31, 1987. Its purpose is to provide helpful information to the researcher, manager, and designer in technology development and mission design according to system, interactive analysis and design, structural and thermal analysis and design, structural concepts and control systems, electronics, advanced materials, assembly concepts, propulsion, and solar power satellite systems. Author

13

ASTRODYNAMICS

Includes powered and free-flight trajectories; and orbital and launching dynamics.

N88-15820*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
A STUDY TO EVALUATE STS HEADS-UP ASCENT TRAJECTORY PERFORMANCE EMPLOYING A MINIMUM-HAMILTONIAN OPTIMIZATION STRATEGY

SUJIT SINHA Feb. 1988 56 p
(NASA-TP-2793; M-580; NAS 1.60:2793) Avail: NTIS HC A04/MF A01 CSCL 22A
ASCENT TRAJECTORIES, EVALUATION, HAMILTONIAN FUNCTIONS, OPTIMIZATION, SPACE TRANSPORTATION SYSTEM

15

LAUNCH VEHICLES AND SPACE VEHICLES

Includes boosters; operating problems of launch/space vehicle systems; and reusable vehicles.

N88-14112*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
HYDROBURST TEST OF A CARBON-CARBON INVOLUTE EXIT CONE
ROY M. SULLIVAN Jan. 1988 33 p
(NASA-TP-2556; NAS 1.60:2556) Avail: NTIS HC A03/MF A01 CSCL 20H
BURST TESTS, CARBON-CARBON COMPOSITES, CONES, EXHAUST NOZZLES, HYDRODYNAMICS

16

SPACE TRANSPORTATION

Includes passenger and cargo space transportation, e.g., shuttle operations; and space rescue techniques.

N88-12520*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
SPACECRAFT FIRE SAFETY
JANICE M. MARGLE, ed. (Pennsylvania State Univ., Abington.) 1987 134 p Workshop held in Cleveland, Ohio, 20-21 Aug. 1986
(NASA-CP-2476; E-3464; NAS 1.55:2476) Avail: NTIS HC A07/MF A01 CSCL 22B
ATMOSPHERIC COMPOSITION, COMBUSTION PHYSICS, CONFERENCES, FIRE EXTINGUISHERS, FIRES, FLAMMABILITY, INERT ATMOSPHERE, SPACE STATIONS, SPACECRAFT ENVIRONMENTS

18

SPACECRAFT DESIGN, TESTING AND PERFORMANCE

Includes satellites; space platforms; space stations; spacecraft systems and components such as thermal and environmental controls; and attitude controls.

N88-11084*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
SPACECRAFT 2000
Jul. 1986 236 p Workshop held in Cleveland, Ohio, 29-31 Jul. 1986
(NASA-CP-2473; E-3358; NAS 1.55:2473) Avail: NTIS HC A11/MF A01 CSCL 22B
CONFERENCES, SPACE STATIONS, SPACECRAFT ELECTRONIC EQUIPMENT, SPACECRAFT PROPULSION, SPACECRAFT TRACKING, SYSTEMS ANALYSIS, TELEMETRY

N88-10829*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
FOURTEENTH SPACE SIMULATION CONFERENCE: TESTING FOR A PERMANENT PRESENCE IN SPACE
JOSEPH L. STECHER, III, ed. 1986 435 p Conference held in Baltimore, Md., 3-6 Nov. 1986; sponsored by NASA, Inst. of Environmental Sciences, AIAA, and the American Society for Testing and Materials
(NASA-CP-2446; REPT-86B0561; NAS 1.55:2446) Avail: NTIS HC A19/MF A01 CSCL 22B
CLEANING, CONFERENCES, SIMULATION, SPACE SHUTTLES, SPACE STATIONS, SPACECRAFT CONTAMINATION, SPACECRAFT ENVIRONMENTS, TEST FACILITIES, THERMAL ENVIRONMENTS

N88-10870*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
SPACE CONSTRUCTION
JANE A. HAGAMAN, ed. Oct. 1987 308 p Conference held in Hampton, Va., 6-7 Aug. 1986
(NASA-CP-2490; L-16378; NAS 1.55:2490) Avail: NTIS HC A14/MF A01 CSCL 22B
CONFERENCES, EXTRAVEHICULAR ACTIVITY, MANAGEMENT PLANNING, MISSION PLANNING, SPACE SHUTTLE PAYLOADS, SPACE STATIONS, SPACE TRANSPORTATION SYSTEM

N88-13382* National Aeronautics and Space Administration, Washington, D.C.
SPACE STATION SYSTEMS: A BIBLIOGRAPHY WITH INDEXES
Nov. 1987 245 p
(NASA-SP-7056(05); NAS 1.21:7056(05)) Avail: NTIS HC A11 CSCL 22B
This bibliography lists 967 reports, articles, and other documents introduced into the NASA scientific and technical information system between January 1, 1987 and June 30, 1987. Its purpose is to provide helpful information to the researcher, manager, and designer in technology development and mission design according to system, interactive analysis and design, structural and thermal analysis and design, structural concepts and control systems, electronics, advanced materials, assembly concepts, propulsion, and solar power satellite systems. The coverage includes documents that define major systems and subsystems, servicing and support requirements, procedures and operations, and missions for the current and future space station. Author

N88-14115*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
CONTINUUM MODELING OF LARGE LATTICE STRUCTURES: STATUS AND PROJECTIONS
AHMED K. NOOR and MARTIN M. MIKULAS, JR. Feb. 1988 79 p
(NASA-TP-2767; L-16360; NAS 1.60:2767) Avail: NTIS HC A05/MF A01 CSCL 22B
CONTINUUM MODELING, LATTICES, STRUCTURAL ANALYSIS, TRUSSES

20

SPACECRAFT PROPULSION AND POWER

Includes main propulsion systems and components, e.g., rocket engines; and spacecraft auxiliary power sources.

N88-12538*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
COMPATABILITY OF DISPERSION-STRENGTHENED PLATINUM WITH RESISTOJET PROPELLANTS
MARGARET V. WHALEN and MICHAEL V. NATHAL Oct. 1987

29 p
(NASA-TP-2765; E-3736; NAS 1.60:2765) Avail: NTIS HC A03/MF A01 CSCL 21H
COMPATIBILITY, DISPERSING, PLATINUM, PRECIPITATION HARDENING, RESISTOJET ENGINES, ROCKET PROPELLANTS

23

CHEMISTRY AND MATERIALS (GENERAL)

N88-12543*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
SURFACE CATALYTIC DEGRADATION STUDY OF TWO LINEAR PERFLUOROPOLYALKYLETHERS AT 345 C
WILFREDO MORALES Nov. 1987 12 p
(NASA-TP-2774; E-3395; NAS 1.60:2774) Avail: NTIS HC A03/MF A01 CSCL 07A
ALKYL COMPOUNDS, CATALYSIS, DEGRADATION, ETHERS, PERFLUORO COMPOUNDS, SURFACE REACTIONS

24

COMPOSITE MATERIALS

Includes physical, chemical, and mechanical properties of laminates and other composite materials.

N88-10117*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
OUTGASSING DATA FOR SELECTING SPACECRAFT MATERIALS
WILLIAM A. CAMPBELL, JR. and RICHARD S. MARRIOTT Aug. 1987 323 p Revised
(NASA-RP-1124; REPT-87B0347; NAS 1.61:1124) Avail: NTIS HC A14/MF A01 CSCL 11D
Outgassing data, derived from tests at 398 K (125 C) for 24 hours in vacuum as per ASTM E 595-77, have been compiled for numerous materials for spacecraft use. The data presented are the total mass loss (TML) and the collected volatile condensable materials (CVCM). The various materials are listed by likely usage and alphabetically. Author

N88-25480*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
PROPERTIES OF TWO COMPOSITE MATERIALS MADE OF TOUGHENED EPOXY RESIN AND HIGH-STRAIN GRAPHITE FIBER
MARVIN B. DOW and DONALD L. SMITH (PRC Kentron, Inc., Hampton, Va.) Jul. 1988 44 p
(NASA-TP-2826; L-16425; NAS 1.60:2826) Avail: NTIS HC A03/MF A01 CSCL 11D
COMPRESSIVE STRENGTH, EPOXY RESINS, GRAPHITE-EPOXY COMPOSITES, REINFORCING FIBERS

N88-70029* National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
EFFECTS OF CONTINUOUS AND CYCLIC THERMAL EXPOSURES ON BORON- AND BORSIC-REINFORCED 6061 ALUMINUM COMPOSITES
GEORGE C. OLSEN and STEPHEN S. TOMPKINS Nov. 1977 48 p
(NASA-TP-1063; L-11722; NAS 1.60:1063) Avail: NTIS
ALUMINUM, BORON, BORSIC (TRADENAME), COMPOSITE MATERIALS, CYCLIC LOADS, METAL MATRIX COMPOSITES, THERMAL CYCLING TESTS

25

INORGANIC AND PHYSICAL CHEMISTRY

Includes chemical analysis, e.g., chromatography; combustion theory; electrochemistry; and photochemistry.

N88-15846*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
AN ANALYTICAL STUDY OF THE HYDROGEN-AIR REACTION MECHANISM WITH APPLICATION TO SCRAMJET COMBUSTION
CASIMIR J. JACHIMOWSKI Feb. 1988 18 p
(NASA-TP-2791; L-16372; NAS 1.60:2791) Avail: NTIS HC A03/MF A01 CSCL 07D
CHEMICAL REACTIONS, COMBUSTION, HYDROGEN OXYGEN ENGINES, REACTION KINETICS, SUPERSONIC COMBUSTION RAMJET ENGINES

N88-16830*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
A RAPID METHOD FOR THE COMPUTATION OF EQUILIBRIUM CHEMICAL COMPOSITION OF AIR TO 15000 K
RAMADAS K. PRABHU (Planning Research Corp., Hampton, Va.) and WAYNE D. ERICKSON Mar. 1988 31 p
(NASA-TP-2792; L-16375; NAS 1.60:2792) Avail: NTIS HC A03/MF A01 CSCL 07D
AIR, ATMOSPHERIC COMPOSITION, CHEMICAL COMPOSITION, CHEMICAL EQUILIBRIUM, COMPUTATION, HIGH TEMPERATURE

27

NONMETALLIC MATERIALS

Includes physical, chemical, and mechanical properties of plastics, elastomers, lubricants, polymers, textiles, adhesives, and ceramic materials.

N88-23872*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
STRUCTURAL CERAMICS
May 1986 226 p Workshop held in Cleveland, Ohio, 20-21 May 1986 Sponsored by NASA, Washington
(NASA-CP-2427; E-3063; NAS 1.55:2427) Avail: NTIS HC A11/MF A01 CSCL 11B
CERAMICS, CONFERENCES, CORROSION, FRACTURE MECHANICS, NONDESTRUCTIVE TESTS, POLYMER CHEMISTRY, TRIBOLOGY

29

MATERIALS PROCESSING

Includes space-based development of products and processes for commercial applications.

N88-10977*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
PREPARATIVE ELECTROPHORESIS FOR SPACE
PERCY H. RHODES and ROBERT S. SNYDER Oct. 1987 15 p
(NASA-TP-2777; NAS 1.60:2777) Avail: NTIS HC A03/MF A01 CSCL 22A
CONVECTIVE FLOW, ELECTROHYDRODYNAMICS,

ELECTROKINETICS, ELECTROPHORESIS, TEMPERATURE EFFECTS

N88-10978*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
CONTINUOUS FLOW ELECTROPHORESIS SYSTEM EXPERIMENTS ON SHUTTLE FLIGHTS STS-4 AND STS-7
ROBERT S. SNYDER, PERCY H. RHODES, and TERESA Y. MILLER Oct. 1987 17 p
(NASA-TP-2778; NAS 1.60:2778) Avail: NTIS HC A03/MF A01 CSCL 22A

CONVECTIVE FLOW, ELECTRICAL RESISTIVITY, ELECTRODYNAMICS, ELECTROPHORESIS, GRAVITATIONAL EFFECTS

N88-14212*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
GROWTH OF SOLID SOLUTION SINGLE CRYSTALS
S. L. LEHOCZKY and F. R. SZOFRAN Dec. 1987 18 p
(NASA-TP-2787; NAS 1.60:2787) Avail: NTIS HC A03/MF A01 CSCL 20B

CRYSTAL GROWTH, MERCURY CADMIUM TELLURIDES, SINGLE CRYSTALS, SOLID SOLUTIONS, THERMOPHYSICAL PROPERTIES

N88-23895*# National Aeronautics and Space Administration, Washington, D.C.
NONCONTACT TEMPERATURE MEASUREMENT
MARK C. LEE, ed. Mar. 1988 429 p Workshop held in Washington, D.C., 30 Apr. - 1 May 1987
(NASA-CP-2503; NAS 1.55:2503) Avail: NTIS HC A19/MF A01 CSCL 12A

CONFERENCES, INFRARED RADIOMETERS, OPTICAL PYROMETERS, RADIATION PYROMETERS, TEMPERATURE MEASUREMENT, TEMPERATURE MEASURING INSTRUMENTS

31

ENGINEERING (GENERAL)

Includes vacuum technology; control engineering; display engineering; cryogenics; and fire prevention.

N88-17969*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
A GENERALIZED METHOD FOR AUTOMATIC DOWNHAND AND WIREFEED CONTROL OF A WELDING ROBOT AND POSITIONER
KEN FERNANDEZ and GEORGE E. COOK (Vanderbilt Univ., Nashville, Tenn.) Feb. 1988 54 p
(NASA-TP-2807; NAS 1.60:2807) Avail: NTIS HC A04/MF A01 CSCL 13H

ARC WELDING, COMPUTER AIDED DESIGN, COMPUTER AIDED MANUFACTURING, PROGRAM VERIFICATION (COMPUTERS), ROBOTICS, ROBOTS

N88-18751*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
FURTHER DEVELOPMENTS IN EXACT STATE RECONSTRUCTION IN DETERMINISTIC DIGITAL CONTROL SYSTEMS
MICHAEL E. POLITES Mar. 1988 19 p
(NASA-TP-2812; NAS 1.60:2812) Avail: NTIS HC A03/MF A01 CSCL 13B

CONTROL SYSTEMS DESIGN, DIGITAL SYSTEMS, EQUATIONS OF STATE, RECONSTRUCTION, STATE ESTIMATION

N88-28177*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
MORE ON EXACT STATE RECONSTRUCTION IN DETERMINISTIC DIGITAL CONTROL SYSTEMS
MICHAEL E. POLITES Sep. 1988 21 p
(NASA-TP-2847; NAS 1.60:2847) Avail: NTIS HC A03/MF A01 CSCL 13B

CONTROL SYSTEMS DESIGN, DIGITAL SYSTEMS, PLANT DESIGN, RECONSTRUCTION, STATE ESTIMATION

32

COMMUNICATIONS AND RADAR

Includes radar; land and global communications; communications theory; and optical communications.

N88-14226*# Colorado Univ., Boulder. Dept. of Electrical Engineering.
PROPAGATION EFFECTS ON SATELLITE SYSTEMS AT FREQUENCIES BELOW 10 GHZ: A HANDBOOK FOR SATELLITE SYSTEMS DESIGN
WARREN L. FLOCK Dec. 1987 501 p
(NAS7-100; JPL-956249)
(NASA-RP-1108/2; NAS 1.61:1108/2) Avail: NTIS HC A22/MF A01 CSCL 22D

Frequencies below 10 GHz continue to be used for a large portion of satellite service, and new applications, including mobile satellite service and the global positioning system, use frequencies below 10 GHz. As frequency decreases below 10 GHz, attenuation due to precipitation and gases decreases and ionospheric effects increase. Thus the ionosphere, which can be largely neglected above 10 GHz, receives major attention. Although attenuation and depolarization due to rain are less severe below 10 GHz than above, they are nevertheless still important and constitute another major topic. The handbook emphasizes the propagation effects on satellite communications but material that is pertinent to radio navigation and positioning systems and deep-space telecommunications is included as well. Chapter 1 through 7 describe the various propagation impairments, and Chapter 9 is devoted to the estimation or calculation of the magnitudes of these effects for use in system design. Chapter 10 covers link power budget equations and the role of propagation effects in these equations. Chapter 8 deals with the complex subject of interference between space and terrestrial systems. Author

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ELECTRONICS AND ELECTRICAL ENGINEERING

Includes test equipment and maintainability; components, e.g., tunnel diodes and transistors; microminiaturization; and integrated circuitry.

N88-11021*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
THE 1986 GODDARD SPACE FLIGHT CENTER BATTERY WORKSHOP
GEORGE W. MORROW, ed. and THOMAS Y. YI, ed. Sep. 1987 374 p Workshop held in Greenbelt, Md., 18-19 Nov. 1986
(NASA-CP-2486; REPT-87B0408; NAS 1.55:2486) Avail: NTIS HC A16/MF A01 CSCL 10C

CONFERENCES, ELECTROCHEMISTRY, FAILURE ANALYSIS, FLIGHT TESTS, LITHIUM SULFUR BATTERIES, NICKEL CADMIUM BATTERIES, NICKEL HYDROGEN BATTERIES

N88-15146*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
PERFORMANCE OF A SMALL, GRAPHITE ELECTRODE, MULTISTAGE DEPRESSED COLLECTOR WITH A 500-W, CONTINUOUS WAVE, 4.8- TO 9.6-GHZ TRAVELING WAVE TUBE
PETER RAMINS, GARY G. LESNY, BEN T. EBIHARA, and SHELLY PEET Feb. 1988 15 p
(NASA-TP-2788; E-3800; NAS 1.60:2788) Avail: NTIS HC A03/MF A01 CSCL 09A
ACCUMULATORS, CONTINUOUS RADIATION, ELECTRODES, GRAPHITE, TRAVELING WAVE TUBES

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FLUID MECHANICS AND HEAT TRANSFER

Includes boundary layers; hydrodynamics; fluidics; mass transfer; and ablation cooling.

N88-14299*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
FLIGHT AND WIND-TUNNEL MEASUREMENTS SHOWING BASE DRAG REDUCTION PROVIDED BY A TRAILING DISK FOR HIGH REYNOLDS NUMBER TURBULENT FLOW FOR SUBSONIC AND TRANSONIC MACH NUMBERS
SHERYLL GOECKE POWERS, JARRETT K. HUFFMAN, and CHARLES H. FOX, JR. (National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.) Nov. 1986 143 p
(NASA-TP-2638; H-1281; NAS 1.60:2638) Avail: NTIS HC A07/MF A01 CSCL 20D
BASE PRESSURE, DRAG REDUCTION, FLIGHT TESTS, TRAILING EDGE FLAPS, TURBULENT FLOW, WIND TUNNEL TESTS

N88-15024*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
CRYOGENIC FLUID MANAGEMENT TECHNOLOGY WORKSHOP. VOLUME 1: PRESENTATION MATERIAL AND DISCUSSION
JOHN C. AYDELOTT, ed. and WILLIAM DEVOL, ed. (Sverdrup Technology, Inc., Middleburg Heights, Ohio.) Sep. 1987 396 p Workshop held in Cleveland, Ohio, 28-30 Apr. 1987
(NASA-CP-10001; E-3732; NAS 1.55:10001) Avail: NTIS HC A17/MF A01 CSCL 20D
CONFERENCES, CRYOGENIC COOLING, CRYOGENIC FLUID STORAGE, CRYOGENIC FLUIDS, CRYOGENIC ROCKET PROPELLANTS, CRYOGENICS, REDUCED GRAVITY

N88-18881*# National Aeronautics and Space Administration. Hugh L. Dryden Flight Research Center, Edwards, Calif.
INFLUENCE OF BASE MODIFICATIONS ON IN-FLIGHT BASE DRAG IN THE PRESENCE OF JET EXHAUST FOR MACH NUMBERS FROM 0.7 TO 1.5
SHERYLL GOECKE POWERS Feb. 1988 20 p
(NASA-TP-2802; H-1408; NAS 1.60:2802) Avail: NTIS HC A03/MF A01 CSCL 20D
BASE FLOW, DRAG, FLIGHT TESTS, JET EXHAUST, MACH NUMBER, REVISIONS

N88-18884*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
GALILEO PROBE PARACHUTE TEST PROGRAM: WAKE PROPERTIES OF THE GALILEO PROBE AT MACH NUMBERS FROM 0.25 TO 0.95
THOMAS N. CANNING (Canning, T. N., Portola Valley, Calif.) and THOMAS M. EDWARDS Apr. 1988 144 p
(NAS2-10000)
(NASA-RP-1130; A-9643; NAS 1.61:1130) Avail: NTIS HC A07/MF A01 CSCL 20D
The results of surveys of the near and far wake of the Galileo Probe are presented for Mach numbers from 0.25 to 0.95. The trends in the data resulting from changes in Mach number, radial and axial distance, angle of attack, and a small change in model shape are shown in crossplots based on the data. A rationale for selecting an operating volume suitable for parachute inflation based on low Mach number flight results is outlined. Author

N88-20599*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
CRYOGENIC FLUID MANAGEMENT TECHNOLOGY WORKSHOP. VOLUME 2: ROUNDTABLE DISCUSSION OF TECHNOLOGY REQUIREMENTS
Mar. 1988 84 p Workshop held in Cleveland, Ohio, 28-30 Apr. 1987
(NASA-CP-10009; E-3967; NAS 1.55:10009) Avail: NTIS HC A05/MF A01 CSCL 20D
CONFERENCES, CRYOGENIC FLUIDS, FLUID MANAGEMENT, TECHNOLOGY ASSESSMENT

N88-22325*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
AEROTHERMAL TESTS OF QUILTED DOME MODELS ON A FLAT PLATE AT A MACH NUMBER OF 6.5
CHRISTOPHER E. GLASS and L. ROANE HUNT May 1988 72 p
(NASA-TP-2804; L-16346; NAS 1.60:2804) Avail: NTIS HC A04/MF A01 CSCL 20D
AEROTHERMODYNAMICS, HYPERSONIC AIRCRAFT, LAMINAR BOUNDARY LAYER, PRESSURE DISTRIBUTION, THERMAL PROTECTION, TURBULENT BOUNDARY LAYER

35

INSTRUMENTATION AND PHOTOGRAPHY

Includes remote sensors; measuring instruments and gages; detectors; cameras and photographic supplies; and holography.

N88-28286*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
OPTICAL MEASUREMENT OF PROPELLER BLADE DEFLECTIONS
ANATOLE P. KURKOV Sep. 1988 31 p
(NASA-TP-2841; E-4131; NAS 1.60:2841) Avail: NTIS HC A03/MF A01 CSCL 14B
DEFLECTION, DISPLACEMENT MEASUREMENT, OPTICAL MEASUREMENT, PROPELLER BLADES

N88-30099*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
MEASUREMENT OF LOCAL HIGH-LEVEL, TRANSIENT SURFACE HEAT FLUX
CURT H. LIEBERT Sep. 1988 9 p Sponsored by NASA, Washington, D.C.
(NASA-TP-2840; E-4200; NAS 1.60:2840) Avail: NTIS HC A02/MF A01 CSCL 14B
HEAT FLUX, SURFACE TEMPERATURE, TEMPERATURE MEASUREMENT, TEMPERATURE MEASURING INSTRUMENTS, TRANSIENT HEATING

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MECHANICAL ENGINEERING

Includes auxiliary systems (nonpower); machine elements and processes; and mechanical equipment.

N88-15224*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
EFFICIENCY TESTING OF A HELICOPTER TRANSMISSION PLANETARY REDUCTION STAGE
ROBERT F. HANDSCHUH and DOUGLAS A. ROHN Feb. 1988 18 p Prepared in cooperation with Army Aviation Research and Development Command, Cleveland, Ohio
(DA PROJ. 1L1-61102-AH-45)
(NASA-TP-2795; E-3770; NAS 1.60:2795; AVSCOM-TR-87-C-28; AD-A191884) Avail: NTIS HC A03/MF A01 CSCL 13I
ENGINE TESTS, GEARS, HELICOPTER ENGINES, POWER EFFICIENCY, TRANSMISSIONS (MACHINE ELEMENTS)

N88-17045*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
DYNAMIC ANALYSIS OF MULTIMESH-GEAR HELICOPTER TRANSMISSIONS
FRED K. CHOY, DENNIS P. TOWNSEND, and FRED B. OSWALD Feb. 1988 22 p
(NASA-TP-2789; E-3191; NAS 1.60:2789) Avail: NTIS HC A03/MF A01 CSCL 13I
DYNAMIC CHARACTERISTICS, GEARS, HELICOPTER ENGINES, SYSTEMS ANALYSIS, TRANSMISSIONS (MACHINE ELEMENTS)

N88-18933*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
COMPUTER-AIDED DESIGN ANALYSIS OF 57-MM, ANGULAR-CONTACT, CRYOGENIC TURBOPUMP BEARINGS
ELIZABETH S. ARMSTRONG and HAROLD H. COE Mar. 1988 15 p
(NASA-TP-2816; E-3890; NAS 1.60:2816) Avail: NTIS HC A03/MF A01 CSCL 13K
BEARINGS, COMPUTER AIDED DESIGN, CRYOGENIC FLUIDS, RETROFITTING, REVISIONS, SERVICE LIFE, SPACE SHUTTLE MAIN ENGINE, TURBINE PUMPS

39

STRUCTURAL MECHANICS

Includes structural element design and weight analysis; fatigue; and thermal stress.

N88-11140*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
TURBINE ENGINE HOT SECTION TECHNOLOGY, 1985
Oct. 1985 443 p Conference held in Cleveland, Ohio, 22-23 Oct. 1985
(NASA-CP-2405; E-2727; NAS 1.55:2405) Avail: NTIS HC A19/MF A01 CSCL 20K
COMBUSTION CHAMBERS, CONFERENCES, GAS TURBINE ENGINES, LININGS, MATHEMATICAL MODELS, METAL FATIGUE, STRUCTURAL ANALYSIS, TURBINE BLADES, VANES

N88-13809*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
THE 58TH SHOCK AND VIBRATION SYMPOSIUM, VOLUME 1
WALTER D. PILKEY, comp. and BARBARA F. PILKEY, comp. (Virginia Univ., Charlottesville.) Oct. 1987 476 p Symposium held in Huntsville, Ala., 13-15 Oct. 1987; sponsored in part by DOD
(NASA-CP-2488-VOL-1; M-571-VOL-1; KAS 1.55:2488-VOL-1) Avail: NTIS HC A21/MF A01 CSCL 20K
CONFERENCES, DYNAMIC STRUCTURAL ANALYSIS, MECHANICAL SHOCK, SHOCK TESTS, SPACE SHUTTLE MAIN ENGINE, STRUCTURAL VIBRATION, VIBRATION DAMPING, VIBRATION ISOLATORS

N88-15263*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
LIFE PREDICTION OF THERMOMECHANICAL FATIGUE USING TOTAL STRAIN VERSION OF STRAINRANGE PARTITIONING (SRP): A PROPOSAL
JAMES F. SALTSMAN and GARY R. HALFORD Feb. 1988 25 p
(NASA-TP-2779; E-3795; NAS 1.60:2779) Avail: NTIS HC A03/MF A01 CSCL 20K
FATIGUE LIFE, LIFE (DURABILITY), METALS, PREDICTIONS

N88-17095*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
STRESS INTENSITY AND CRACK DISPLACEMENT FOR SMALL EDGE CRACKS
THOMAS W. ORANGE Feb. 1988 11 p
(NASA-TP-2801; E-3744; NAS 1.60:2801) Avail: NTIS HC A03/MF A01 CSCL 20K
CRACKS, DISPLACEMENT, EDGES, ELASTIC DEFORMATION, STRESS INTENSITY FACTORS

N88-18948*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
THE 58TH SHOCK AND VIBRATION SYMPOSIUM, VOLUME 2
WALTER D. PILKEY, comp. and BARBARA F. PILKEY, comp. (Virginia Univ., Charlottesville.) Feb. 1988 208 p Symposium held in Huntsville, Ala., 13-15 Oct. 1987; sponsored in part by DOD
(NASA-CP-2488-VOL-2; M-572-VOL-2; NAS 1.55:2488-VOL-2) Avail: NTIS HC A10/MF A01 CSCL 20K
CONFERENCES, DYNAMIC STRUCTURAL ANALYSIS, FINITE ELEMENT METHOD, SPACECRAFT COMPONENTS, SPACECRAFT DESIGN, SPECTRUM ANALYSIS, STRUCTURAL VIBRATION

N88-20852*# Computer Software Management and Information Center, Athens, Ga.
SIXTEENTH NASTRAN (TRADEMARK) USERS' COLLOQUIUM
Mar. 1988 196 p Colloquium held in Arlington, Va., 25-29 Apr. 1988
(NASA-CP-2505; NAS 1.55:2505) Avail: NTIS HC A09/MF A01 CSCL 20K
CONFERENCES, NASTRAN, STRUCTURAL ANALYSIS

N88-21456*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
ADVANCES IN CONTACT ALGORITHMS AND THEIR APPLICATION TO TIRES
AHMED K. NOOR and JOHN A. TANNER Apr. 1988 36 p Prepared at the American Chemical Society Meeting, Montreal, Que., 26-29 May 1987 Original contains color illustrations
(NASA-TP-2781; L-16376; NAS 1.60:2781) Avail: NTIS HC A03/MF A01 CSCL 20K
ALGORITHMS, FRICTION, SURFACE PROPERTIES, TIRES

N88-21468*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
THE 22ND AEROSPACE MECHANISMS SYMPOSIUM
May 1988 416 p Symposium held in Hampton, Va.; sponsored by NASA, Washington, California Inst. of Tech., Pasadena, and LMSC, Sunnyvale, Calif.
(NASA-CP-2506; L-16433; NAS 1.55:2506) Avail: NTIS HC A18/MF A01 CSCL 20K
ACTUATORS, BEARINGS, MAGNETIC SUSPENSION, MECHANICAL DRIVES, TELEOPERATORS, VIBRATION ISOLATORS

N88-21488*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
NONLINEAR CONSTITUTIVE RELATIONS FOR HIGH TEMPERATURE APPLICATIONS, 1986
Apr. 1988 482 p Symposium held in Akron, Ohio, 11-13 Jun. 1986; sponsored by NASA, Lewis Research Center, Cleveland, Ohio and Akron Univ., Ohio
(NASA-CP-10010; E-3956; NAS 1.55:10010) Avail: NTIS HC A21/MF A01 CSCL 20K
CONSTITUTIVE EQUATIONS, MATHEMATICAL MODELS, REFRACTORY MATERIALS, STRESS ANALYSIS, STRUCTURAL ANALYSIS, VISCOPLASTICITY

N88-22382*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
LEWIS STRUCTURES TECHNOLOGY, 1988. VOLUME 2: STRUCTURAL MECHANICS
May 1988 307 p Symposium held in Cleveland, Ohio, 24-25 May 1988
(NASA-CP-3003-VOL-2; E-3970-VOL-2; NAS 1.55:3003-VOL-2) Avail: NTIS HC A14/MF A01 CSCL 20K
AIRCRAFT ENGINES, DYNAMIC STRUCTURAL ANALYSIS, FATIGUE (MATERIALS), FRACTURE MECHANICS, STRESS ANALYSIS

N88-22408*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
LEWIS STRUCTURES TECHNOLOGY, 1988. VOLUME 3: STRUCTURAL INTEGRITY FATIGUE AND FRACTURE WIND TURBINES HOST
May 1988 366 p Symposium held in Cleveland, Ohio, 24-25 May 1988
(NASA-CP-3003-VOL-3; E-3970-VOL-3; NAS 1.55:3003-VOL-3) Avail: NTIS HC A16/MF A01 CSCL 20K
CONFERENCES, DYNAMIC STRUCTURAL ANALYSIS, FRACTURE MECHANICS, METAL FATIGUE, NONDESTRUCTIVE TESTS, PARALLEL PROCESSING (COMPUTERS), WIND TURBINES

N88-23226*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
LEWIS STRUCTURES TECHNOLOGY, 1988. VOLUME 1: STRUCTURAL DYNAMICS
May 1988 463 p Symposium held in Cleveland, Ohio, 24-25 May 1988
(NASA-CP-3003-VOL-1; E-3970-VOL-1; NAS 1.55:3003-VOL-1) Avail: NTIS HC A20/MF A01 CSCL 20K
AEROELASTICITY, COMPUTER TECHNIQUES, CONFERENCES, DYNAMIC STRUCTURAL ANALYSIS, NASTRAN, PARALLEL PROCESSING (COMPUTERS), SPACECRAFT STRUCTURES, STRUCTURAL VIBRATION, TURBINE BLADES, VIBRATION DAMPING, WIND TURBINES

N88-23988*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
DYNAMIC CHARACTERISTICS OF A VIBRATING BEAM WITH PERIODIC VARIATION IN BENDING STIFFNESS
JOHN S. TOWNSEND Feb. 1987 23 p Previously announced as N87-22726
(NASA-TP-2697; NAS 1.60:2697) Avail: NTIS HC A03/MF A01 CSCL 20K
BEAMS (SUPPORTS), BENDING, BENDING VIBRATION, DYNAMIC CHARACTERISTICS, MODAL RESPONSE, MODULATION, PERIODIC VARIATIONS, STIFFNESS

N88-25013*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
SRM PROPELLANT AND POLYMER MATERIALS STRUCTURAL TEST PROGRAM
CARLETON J. MOORE May 1988 16 p
(NASA-TP-2821; NAS 1.60:2821) Avail: NTIS HC A03/MF A01 CSCL 20K
DYNAMIC STRUCTURAL ANALYSIS, PERFORMANCE TESTS, SOLID PROPELLANT ROCKET ENGINES, SPACE SHUTTLE BOOSTERS

N88-26884*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
THREE-DIMENSIONAL ANALYSIS OF A POSTBUCKLED EMBEDDED DELAMINATION
JOHN D. WHITCOMB Jul. 1988 26 p
(NASA-TP-2823; L-16453; NAS 1.60:2823) Avail: NTIS HC A03/MF A01 CSCL 20K
BUCKLING, DELAMINATING, FINITE ELEMENT METHOD, LAMINATES, STRAIN ENERGY RELEASE RATE

N88-28343*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
SRM (SOLID ROCKET MOTOR) PROPELLANT AND POLYMER MATERIALS STRUCTURAL MODELING
CARLETON J. MOORE Aug. 1988 42 p
(NASA-TP-2824; NAS 1.60:2824) Avail: NTIS HC A03/MF A01 CSCL 20K
POLYMERIC FILMS, PROPELLANTS, SOLID PROPELLANT ROCKET ENGINES, STRUCTURAL ANALYSIS

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GEOSCIENCES (GENERAL)

N88-13774*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
SCIENTIFIC AND OPERATIONAL REQUIREMENTS FOR TOMS DATA
ARLIN J. KRUEGER, ed. Dec. 1987 112 p Conference held in Greenbelt, Md., 13-11 Sep. 1986
(NASA-CP-2497; REPT-87B00206; NAS 1.55:2497) Avail: NTIS HC A06/MF A01 CSCL 04A
ATMOSPHERIC CHEMISTRY, CONFERENCES, MAPPING, OZONE DEPLETION, OZONOMETRY, PHOTOCHEMICAL REACTIONS, SATELLITE SOUNDING, TOTAL OZONE MAPPING SPECTROMETER, TROPOSPHERE

N88-17096*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
NIMBUS 7 SOLAR BACKSCATTER ULTRAVIOLET (SBUV) SPECTRAL SCAN SOLAR IRRADIANCE AND EARTH RADIANCE PRODUCT USER'S GUIDE
BARRY M. SCHLESINGER, RICHARD P. CEBULA (ST Systems Corp., Hyattsville, Md.), DONALD F. HEATH, and ALBERT J. FLEIG Feb. 1988 65 p
(NAS5-29386)
(NASA-RP-1199; NAS 1.61:1199; REPT-88-0004) Avail: NTIS HC A04/MF A01 CSCL 04A
The archived tape products from the spectral scan mode measurements of solar irradiance (SUNC tapes) and Earth radiance (EARTH tapes) by the Solar Backscatter UV (SBUV) instrument aboard Nimbus 7 are described. Incoming radiation from 160 to 400 nm is measured at intervals of 0.2 nm. The scan-to-scan repeatability of the solar irradiance measurements ranges from approximately 0.5 to 1 percent longward of 280 nm, to 2 percent around 210 nm and 4 percent near 175 nm. The repeatability of the Earth radiance values ranges from 2 to 3 percent at longer wavelengths and low zenith angles to 10 percent at shorter wavelengths and high zenith angles. The tape formats are described in detail, including file structure and contents of each type of record. Catalogs of the tapes and the time period covered are provided, along with lists of the days lacking solar irradiance measurements and the days dedicated to Earth radiance measurements. The method for production of the tapes is outlined

and quality control measures are described. How radiances and irradiances are derived from the raw counts, the corrections for changes in instrument sensitivity, and related uncertainties are discussed. Author

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EARTH RESOURCES AND REMOTE SENSING

Includes remote sensing of earth resources by aircraft and spacecraft; photogrammetry; and aerial photography.

N88-22714*# National Aeronautics and Space Administration, Goddard Space Flight Center, Greenbelt, Md.
THE 1987 AIRBORNE ANTARCTIC OZONE EXPERIMENT: THE NIMBUS-7 TOMS DATA ATLAS
ARLIN J. KRUEGER, PHILIP E. ARDANUY, FRANK S. SECHRIST, LANNING M. PENN, DAVID E. LARKO, SCOTT D. DOIRON, and REGINALD N. GALIMORE (Science Applications Research, Lanham, Md.) Mar. 1988 246 p
(NASA-RP-1201; REPT-88B0107; NAS 1.61:1201) Avail: NTIS HC A11/MF A01 CSCL 04B

Total ozone data taken by the Nimbus-7 Total Ozone Mapping Spectrometer (TOMS) played a central role in the successful outcome of the 1987 Airborne Antarctic Ozone Experiment. The near-real-time TOMS total ozone observations were supplied within hours of real time to the operations center in Punta Arenas, Chile, over a telecommunications network designed specifically for this purpose. The TOMS data preparation and method of transfer over the telecommunications links are reviewed. This atlas includes a complete set of the near-real-time TOMS orbital overpass data over regions around the Palmer Peninsula of Antarctica for the period of August 8 through September 29, 1987. Also provided are daily polar orthographic projections of TOMS total ozone measurements over the Southern Hemisphere from August through November 1987. In addition, a chronology of the salient points of the experiment, along with some latitudinal cross sections and time series at locations of interest of the TOMS total ozone observations are presented. The TOMS total ozone measurements are evaluated along the flight tracks of each of the ER-2 and DC-8 missions during the experiment. The ozone hole is shown here to develop in a monotonic progression throughout late August and September. The minimum total ozone amount was found on 5 October, when its all-time lowest value of 109 DU is recorded. The hole remains well defined, but fills gradually from mid-October through mid-November. The hole's dissolution is observed here to begin in mid-November, when it elongates and begins to rotate. By the end of November, the south pole is no longer located within the ozone hole. Author

N88-23314* National Aeronautics and Space Administration, Washington, D.C.
EARTH RESOURCES: A CONTINUING BIBLIOGRAPHY WITH INDEXES (ISSUE 57)
May 1988 129 p
(NASA-SP-7041(57); NAS 1.21:7041(57)) Avail: NTIS HC A07 CSCL 08B

This bibliography lists 451 reports, articles and other documents introduced into the NASA scientific and technical information system between January 1 and March 31, 1988. Emphasis is placed on the use of remote sensing and geophysical instrumentation in spacecraft and aircraft to survey and inventory natural resources and urban areas. Subject matter is grouped according to agriculture and forestry, environmental changes and cultural resources, geodesy and cartography, geology and mineral resources, hydrology and water management, data processing and distribution systems, instrumentation and sensors, and economic analysis. Author

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GEOPHYSICS

Includes aeronomy; upper and lower atmosphere studies; ionospheric and magnetospheric physics; and geomagnetism.

N88-10094*# National Aeronautics and Space Administration, Washington, D.C.
INTO THE THERMOSPHERE: THE ATMOSPHERE EXPLORERS
ERIC BURGESS and DOUGLASS TORR 1987 172 p Original document contains color illustrations
(NASA-SP-490; NAS 1.21:490; LC-87-14156) Avail: SOD HC $14.00 as 033-000-01013-3; NTIS MF A01 CSCL 04A

The need to study the lower thermosphere with the new instrument, data handling, and spacecraft technology available in the 1960s led to the formulation and establishment of the Atmospheric Explorer program. This book provides an overview of this program with particular emphasis on the AE3, AE4, and AE5 satellites, which represent early examples of problem-dedicated missions. Both the satellites and their instrumentation on the one hand and the experimental and scientific considerations in studying the thermosphere on the other are discussed. J.P.B.

N88-19037*# National Aeronautics and Space Administration, Goddard Space Flight Center, Greenbelt, Md.
CRUSTAL DYNAMICS PROJECT: CATALOGUE OF SITE INFORMATION
CAREY E. NOLL, ed. Mar. 1988 539 p
(NASA-RP-1198; REPT-88B9999; NAS 1.61:1198) Avail: NTIS HC A23/MF A01 CSCL 08G

This document represents a catalog of site information for the Crustal Dynamics Project. It contains information on and descriptions of those sites used by the Project as observing stations for making the precise geodetic measurements necessary for studies of the Earth's crustal movements and deformation. Author

N88-25094*# National Aeronautics and Space Administration, Langley Research Center, Hampton, Va.
SAM 2 DATA USER'S GUIDE
W. P. CHU, M. T. OSBORN (ST Systems Corp., Hampton, Va.), and L. R. MCMASTER Jul. 1988 29 p
(NASA-RP-1200; L-16377; NAS 1.61:1200) Avail: NTIS HC A03/MF A01 CSCL 04A

This document is intended to serve as a guide to the use of the data products from the Stratospheric Aerosol Measurement (SAM) 2 experiment for scientific investigations of polar stratospheric aerosols. Included is a detailed description of the Beta and Aerosol Number Density Archive Tape (BANAT), which is the SAM 2 data product containing the aerosol extinction data available for these investigations. Also included are brief descriptions of the instrument operation, data collection, processing and validation, and some of the scientific analyses conducted to date. Author

N88-29233*# National Aeronautics and Space Administration, Washington, D.C.
PRESENT STATE OF KNOWLEDGE OF THE UPPER ATMOSPHERE 1988: AN ASSESSMENT REPORT
R. T. WATSON, M. J. PRATHER, and M. J. KURYLO Jun. 1988 203 p
(NASA-RP-1208; NAS 1.61:1208) Avail: NTIS HC A10/MF A01 CSCL 04A

This document was issued in response to the Clean Air Act Amendments of 1977, Public Law 95-95, mandating that NASA and other key agencies submit biennial reports to Congress and EPA. NASA is to report on the state of our knowledge of the upper atmosphere, particularly the stratosphere. This is the sixth ozone assessment report submitted to Congress and the concerned regulatory agencies. Part 1 contains an outline of the NASA Upper Atmosphere Research Program and summaries of the research

efforts supported during the last two years. An assessment is presented of the state of knowledge as of March 15, 1988 when the Ozone Trends Panel, organized by NASA and co-sponsored by the World Meteorological Organization, NOAA, FAA and the United Nations Environment Program released an executive summary of its findings from a critical in-depth study involving over 100 scientists from 12 countries. Chapter summaries of the International Ozone Trends Panel Report form the major part of this report. Two other sections are Model Predictions of Future Ozone Change and Chemical Kinetics and Photochemical Data for Use in Stratospheric Modeling. Each of these sections and the report in its entirety were peer reviewed. Author

N88-29234*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
FORTY-EIGHT-INCH LIDAR AEROSOL MEASUREMENTS TAKEN AT THE LANGLEY RESEARCH CENTER, MAY 1974 TO DECEMBER 1987
W. H. FULLER, JR., M. T. OSBORN, and W. H. HUNT (Wyle Labs., Inc., Hampton, Va.) Oct. 1988 102 p
(NASA-RP-1209; L-16473; NAS 1.61:1209) Avail: NTIS HC A06/MF A01 CSCL 04A

A ground based lidar system located at NASA Langley Research Center in Hampton, Va., was used to obtain high resolution vertical profiles of the stratospheric and upper tropospheric aerosol since 1974. More than 200 measurements obtained at a wavelength of 0.6943 microns during 1974 to 1987 are summarized. Plots of peak backscatter mixing ratio and integrated backscatter vs time are presented for the entire measurement sequence. The plots highlight the influence of several major volcanic eruptions on the long term stratospheric aerosol layer. In particular, the eruptions of El Chichon in late Mar. to early Apr. 1982, produced a massive aerosol layer. Aerosol enhancement from El Chichon reached Hampton, Va. by May 1982, with a scattering ratio of approx. 50 detected on Jul. 1, 1982. In addition, scattering ratio profiles for June 1982 to December 1987, along with tables containing numerical values of the backscatter ratio and backscattering function versus altitude, are included to further describe the upper tropospheric and stratospheric aerosol layer. A 14 year summary is presented, in a ready to use format, of lidar observations at a fixed midlatitude location to be used for further study. Author

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METEOROLOGY AND CLIMATOLOGY

Includes weather forecasting and modification.

N88-10451*# National Aeronautics and Space Administration, Washington, D.C.
ATLAS OF WIDE-FIELD-OF-VIEW OUTGOING LONGWAVE RADIATION DERIVED FROM NIMBUS 7 EARTH RADIATION BUDGET DATA SET - NOVEMBER 1978 TO OCTOBER 1985
T. DALE BESS and G. LOUIS SMITH Aug. 1987 176 p
(NASA-RP-1186; L-16326; NAS 1.61:1186) Avail: NTIS HC A09/MF A01 CSCL 04B

An atlas of monthly mean outgoing longwave radiation global contour maps and associated spherical harmonic coefficients is presented. The atlas contains 84 months of continuous data from November 1978 to October 1985. The data were derived from the second Earth radiation budget experiment, which was flown on the Nimbus 7 Sun-synchronous satellite in 1978. This data set is a companion set and extension to a similar report of the Nimbus 6 satellite. Together these two reports give a data set covering a 10 year time period and will be very valuable in studying different aspects of our changing climate over monthly, annual, and interannual scales in the time domain and over regional, zonal, and global scales in the spatial domain. Author

N88-14572*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
DESCRIPTION OF DATA ON THE NIMBUS 7 LIMS MAP ARCHIVE TAPE: WATER VAPOR AND NITROGEN DIOXIDE
KENNETH V. HAGGARD, B. T. MARSHALL (G and A Technical Software, Hampton, Va.), ROBERT J. KURZEJA (Du Pont de Nemours, E. I. and Co., Aiken, S.C.), ELLIS E. REMSBERG, and JAMES M. RUSSELL, III Feb. 1988 69 p
(NASA-TP-2761; L-16313; NAS 1.60:2761) Avail: NTIS HC A04/MF A01 CSCL 04B

ATMOSPHERIC COMPOSITION, EARTH LIMB, INFRARED DETECTORS, MAPPING, NIMBUS 7 SATELLITE, STRATOSPHERE

N88-26772*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
SUMMARY OF ALONG-TRACK DATA FROM THE EARTH RADIATION BUDGET SATELLITE FOR SEVERAL MAJOR DESERT REGIONS
DAVID R. BROOKS and MARTA A. FENN May 1988 147 p
(NASA-RP-1197; L-16401; NAS 1.61:1197) Avail: NTIS HC A07/MF A01 CSCL 04B

For several days in January and August 1985, the Earth Radiation Budget Satellite, a component of the Earth Radiation Budget Experiment (ERBE), was operated in an along-track scanning mode. A survey of radiance measurements is given for four desert areas in Africa, the Arabian Peninsula, Australia, and the Sahel region of Africa. Each overflight provides radiance information for four scene categories: clear, partly cloudy, mostly cloudy, and overcast. The data presented include the variation of radiance in each scene classification as a function of viewing zenith angle during each overflight of the five target areas. Several features of interest in the development of anisotropic models are evident, including day-night differences in longwave limb darkening and the azimuthal dependence of short wave radiance. There is some evidence that surface features may introduce thermal or visible shadowing that is not incorporated in the usual descriptions of the anisotropic behavior of radiance as viewed from space. The data also demonstrate that the ERBE scene classification algorithms give results that, at least for desert surfaces, are a function of viewing geometry. Author

N88-25105*# Tennessee Univ. Space Inst., Tullahoma.
METEOROLOGICAL AND ENVIRONMENTAL INPUTS TO AVIATION SYSTEMS
DENNIS W. CAMP, ed. and WALTER FROST, ed. Jun. 1988 226 p Workshop held in Tullahoma, Tenn., 12-14 Mar. 1985; sponsored by NASA, Washington, NOAA, FAA, DOD, and Office of the Federal Coordinator for Meteorology
(NASA-CP-2498; L-16338; NAS 1.55:2498) Avail: NTIS HC A11/MF A01 CSCL 04B

AVIATION METEOROLOGY, FLIGHT SAFETY, WEATHER

N88-27677*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
ANGULAR RADIATION MODELS FOR EARTH-ATMOSPHERE SYSTEM. VOLUME 1: SHORTWAVE RADIATION
J. T. SUTTLES, R. N. GREEN, P. MINNIS, G. L. SMITH, W. F. STAYLOR, B. A. WIELICKI, I. J. WALKER, D. F. YOUNG, V. R. TAYLOR, and L. L. STOWE (National Oceanic and Atmospheric Administration, Washington, D. C.) Jul. 1988 148 p
(NASA-RP-1184; L-16414; NAS 1.61:1184) Avail: NTIS HC A07/MF A01 CSCL 04B

Presented are shortwave angular radiation models which are required for analysis of satellite measurements of Earth radiation, such as those fro the Earth Radiation Budget Experiment (ERBE). The models consist of both bidirectional and directional parameters. The bidirectional parameters are anisotropic function, standard deviation of mean radiance, and shortwave-longwave radiance correlation coefficient. The directional parameters are mean albedo as a function of Sun zenith angle and mean albedo normalized to overhead Sun. Derivation of these models from the Nimbus 7 ERB (Earth Radiation Budget) and Geostationary Operational

Environmental Satellite (GOES) data sets is described. Tabulated values and computer-generated plots are included for the bidirectional and directional modes. Author

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LIFE SCIENCES (GENERAL)

N88-15354*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
MICROGRAVITY PARTICLE RESEARCH ON THE SPACE STATION
STEVEN W. SQUYRES, ed., CHRISTOPHER P. MCKAY, ed., and DEBORAH E. SCHWARTZ, ed. Dec. 1987 48 p Workshop held in Moffett Field, Calif., 22-24 Aug. 1985
(NASA-CP-2496; A-87361; NAS 1.55:2496) Avail: NTIS HC A03/MF A01 CSCL 06B
PARTICLES, REDUCED GRAVITY, SPACE STATION PAYLOADS, SPACEBORNE EXPERIMENTS

N88-17168*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.
SPACE BIOREACTOR SCIENCE WORKSHOP
DENNIS R. MORRISON, ed. Dec. 1987 183 p Workshop held in Houston, Tex., 22-23 Aug. 1985
(NASA-CP-2485; S-564; NAS 1.55:2485) Avail: NTIS HC A09/MF A01 CSCL 06B
BIOPROCESSING, BIOREACTORS, BIOTECHNOLOGY, CELLS (BIOLOGY), CONFERENCES, CULTURE TECHNIQUES, REDUCED GRAVITY, SPACE PROCESSING, TISSUES (BIOLOGY)

N88-19883*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
SPACE STATION HUMAN FACTORS RESEARCH REVIEW. VOLUME 3: SPACE STATION HABITABILITY AND FUNCTION: ARCHITECTURAL RESEARCH
MARC M. COHEN, ed., ALICE EICHOLD, ed., and SUSAN HEERS, ed. Oct. 1987 211 p Workshop held at Moffett Field, Calif., 3-6 Dec. 1985
(NASA-CP-2426-VOL-3; A-86263-VOL-3; NAS 1.55:2426-VOL-3) Avail: NTIS HC A10/MF A01 CSCL 05H
ARCHITECTURE, HUMAN FACTORS ENGINEERING, SPACE STATIONS, SPACECRAFT DESIGN

N88-24145*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
SPACE STATION HUMAN FACTORS RESEARCH REVIEW. VOLUME 1: EVA RESEARCH AND DEVELOPMENT
MARC M. COHEN, ed. and H. C. VYKUKAL, ed. Apr. 1988 136 p Workshop held at Moffett Field, Calif., 3-6 Dec. 1985
(NASA-CP-2426-VOL-1; A-87163-VOL-1; NAS 1.55:2426-VOL-1) Avail: NTIS HC A07/MF A01 CSCL 06B
CONFERENCES, EXTRAVEHICULAR ACTIVITY, HUMAN FACTORS ENGINEERING, SPACE STATIONS

N88-24148*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
SPACE STATION HUMAN FACTORS RESEARCH REVIEW. VOLUME 4: INHOUSE ADVANCED DEVELOPMENT AND RESEARCH
TRIEVE TANNER, ed., YVONNE A. CLEARWATER, ed., and MARC M. COHEN, ed. May 1988 135 p Workshop held at Moffett Field, Calif., 3-6 Dec. 1985
(NASA-CP-2426-VOL-4; A-87247-VOL-4; NAS 1.55:2426-VOL-4) Avail: NTIS HC A07/MF A01 CSCL 06B
HUMAN FACTORS ENGINEERING, SPACE STATIONS, SPACECRAFT DESIGN

52

AEROSPACE MEDICINE

Includes physiological factors; biological effects of radiation; and effects of weightlessness on man and animals.

N88-14823*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.
AIRBORNE PARTICULATE MATTER IN SPACECRAFT
Feb. 1988 15 p Presented at a Panel Discussion held in Houston, Tex., 23-24 Jul. 1987
(NAS9-17200)
(NASA-CP-2499; S-570; NAS 1.55:2499) Avail: NTIS HC A03/MF A01 CSCL 06K
AEROSOLS, AEROSPACE ENVIRONMENTS, AIR PURIFICATION, AIR QUALITY, SPACECRAFT DESIGN

N88-18180* National Aeronautics and Space Administration, Washington, D.C.
AEROSPACE MEDICINE AND BIOLOGY: A CUMULATIVE INDEX TO A CONTINUING BIBLIOGRAPHY (SUPPLEMENT 306)
Jan. 1988 210 p
(NASA-SP-7011(306); NAS 1.21:7011(306)) Avail: NTIS HC A10 CSCL 06E
This publication is a cumulative index to the abstracts contained in the Supplements 294 through 305 of Aerospace Medicine and Biology: A Continuing Bibliography. It includes seven indexes - subject, personal author, corporate source, foreign technology, contract number, report number, and accession number. Author

N88-30281* National Aeronautics and Space Administration, Washington, D.C.
AEROSPACE MEDICINE AND BIOLOGY: A CONTINUING BIBLIOGRAPHY WITH INDEXES (SUPPLEMENT 315)
Oct. 1988 71 p
(NASA-SP-7011(315); NAS 1.21:7011(315)) Avail: NTIS HC A04; NTIS standing order as PB88-912300. $9.00 domestic, $18.00 foreign CSCL 06E
This bibliography lists 211 reports, articles and other documents introduced into the NASA scientific and technical information system in September, 1988. Author

53

BEHAVIORAL SCIENCES

Includes psychological factors; individual and group behavior; crew training and evaluation; and psychiatric research.

N88-23370*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
MENTAL-STATE ESTIMATION, 1987
J. RAYMOND COMSTOCK, JR., comp. May 1988 393 p Workshop held in Williamsburg, Va., 3-4 Jun. 1987; sponsored by NASA, Langley Research Center, Hampton, Va. and Old Dominion Univ., Norfolk, Va. Sponsored by NASA, Washington
(NASA-CP-2504; L-16420; NAS 1.55:2504) Avail: NTIS HC A17/MF A01 CSCL 05J
BIOMETRICS, ESTIMATING, HUMAN PERFORMANCE, MENTAL PERFORMANCE, OPERATOR PERFORMANCE, PSYCHOMOTOR PERFORMANCE, STRESS (PSYCHOLOGY), WORKLOADS (PSYCHOPHYSIOLOGY), WORKSTATIONS

54

MAN/SYSTEM TECHNOLOGY AND LIFE SUPPORT

Includes human engineering; biotechnology; and space suits and protective clothing.

N88-12251*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
CONTROLLED ECOLOGICAL LIFE SUPPORT SYSTEM: REGENERATIVE LIFE SUPPORT SYSTEMS IN SPACE
ROBERT D. MACELROY and DAVID T. SMERNOFF (New Hampshire Univ., Durham.) Sep. 1987 153 p The 26th COSPAR Meeting held in Toulouse, France, Jul. 1986
(NCC2-231)
(NASA-CP-2480; A-87256; NAS 1.55:2480) Avail: NTIS HC A08/MF A01 CSCL 06K
ALGAE, CLOSED ECOLOGICAL SYSTEMS, GAS EXCHANGE, VEGETATION GROWTH

N88-13852*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
CONTROLLED ECOLOGICAL LIFE SUPPORT SYSTEM. DESIGN, DEVELOPMENT, AND USE OF A GROUND-BASED PLANT GROWTH MODULE
ROBERT D. MACELROY, DAVID T. SMERNOFF (New Hampshire Univ., Durham.), and JOHN D. RUMMEL Sep. 1987 83 p Meeting held at Moffett Field, Calif., Sep. 1984, in Cocoa Beach, Fla., Apr. 1985 and in Carmel, Calif., 23-25 Apr. 1986
(NCC2-27)
(NASA-CP-2479; A-87255; NAS 1.55:2479) Avail: NTIS HC A05/MF A01 CSCL 06K
CLOSED ECOLOGICAL SYSTEMS, CROP GROWTH, EXPERIMENT DESIGN, FOOD, LABORATORY EQUIPMENT, PLANTS (BOTANY)

59

MATHEMATICAL AND COMPUTER SCIENCES (GENERAL)

N89-12928*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
APPLICATIONS OF THE HYBRID AUTOMATED RELIABILITY PREDICTOR
SALVATORE J. BAVUSO, JOANNE BECHTA DUGAN, KISHOR T. TRIVEDI, BETH ROTHMANN, and MARK BOYD (Duke Univ., Durham, N. C.) 1987 31 p
(NASA-TP-2760; L-16304; NAS 1.60:2760) Avail: NTIS HC A03/MF A01 CSCL 12A
APPLICATIONS PROGRAMS (COMPUTERS), COMPUTER SYSTEMS PERFORMANCE, FLIGHT CONTROL, LOCAL AREA NETWORKS, PERFORMANCE PREDICTION, RELIABILITY ANALYSIS, SYSTEMS ANALYSIS

N88-14629*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
A GENERAL SOLUTION TO THE SILHOUETTE PROBLEM
DAVID R. HEDGLEY, JR. Feb. 1987 9 p
(NASA-TP-2695; H-1348; NAS 1.60:2695) Avail: NTIS HC A02/MF A01 CSCL 12A
COMPUTER GRAPHICS, DISPLAY DEVICES, IMAGE ENHANCEMENT, IMAGE PROCESSING

N88-17206*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.
FIRST ANNUAL WORKSHOP ON SPACE OPERATIONS AUTOMATION AND ROBOTICS (SOAR 87)
SANDY GRIFFIN, ed. Oct. 1987 530 p Workshop held in Houston, Tex., 5-7 Aug. 1987; sponsored by NASA, Johnson Space Flight Center and the US Air Force
(NASA-CP-2491; S-567; NAS 1.55:2491) Avail: NTIS HC A23/MF A01 CSCL 12B
ARCHITECTURE (COMPUTERS), AUTOMATIC CONTROL, COMPUTER AIDED DESIGN, CONFERENCES, DISTRIBUTED PROCESSING, EXPERT SYSTEMS, LOGISTICS, MAN MACHINE SYSTEMS, NEURAL NETS, PARALLEL PROCESSING (COMPUTERS), ROBOTICS

N88-21646*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
CARE 3 USER'S WORKSHOP
Apr. 1988 160 p Workshop held in Hampton, Va., 6-7 Oct. 1987; sponsored by NASA, Washington
(NASA-CP-10011; NAS 1.55:10011) Avail: NTIS HC A08/MF A01 CSCL 12A
COMPUTER PROGRAMS, CONFERENCES, FAULT TOLERANCE, RELIABILITY ANALYSIS

60

COMPUTER OPERATIONS AND HARDWARE

Includes hardware for computer graphics, firmware, and data processing.

N88-20833*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
DIGITAL ENHANCEMENT OF FLOW FIELD IMAGES
ROBERT A. KUDLINSKI and STEPHEN K. PARK Mar. 1988 25 p Original contains color illustrations
(NASA-TP-2770; L-16318; NAS 1.60:2770) Avail: NTIS HC A03/MF A01 CSCL 09B
DIGITAL TECHNIQUES, FLOW VISUALIZATION, IMAGE ENHANCEMENT, IMAGE PROCESSING, PHOTOGRAPHIC PROCESSING

61

COMPUTER PROGRAMMING AND SOFTWARE

Includes computer programs, routines, and algorithms, and specific applications, e.g., CAD/CAM.

N88-16360*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
THIRD CONFERENCE ON ARTIFICIAL INTELLIGENCE FOR SPACE APPLICATIONS, PART 1
JUDITH S. DENTON, comp., MICHAEL S. FREEMAN, comp., and MARY VEREEN, comp. Nov. 1987 421 p Conference held in Huntsville, Ala., 2-3 Nov. 1987; sponsored by NASA, Marshall Space Flight Center, Huntsville, Ala. and Alabama Univ., Huntsville
(NASA-CP-2492-Pt-1; M-575-PT-1; NAS 1.55:2492-Pt-1) Avail: NTIS HC A18/MF A01 CSCL 09B
COMPUTER PROGRAMS, CONFERENCES, DATA BASE MANAGEMENT SYSTEMS, EXPERT SYSTEMS, KNOWLEDGE, MAN MACHINE SYSTEMS, ROBOTICS, SCHEDULING, SPACE SHUTTLES, SPACE STATIONS, SPACECRAFT CONTROL

N88-24188*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
THIRD CONFERENCE ON ARTIFICIAL INTELLIGENCE FOR SPACE APPLICATIONS, PART 2
JUDITH S. DENTON, comp., MICHAEL S. FREEMAN, comp., and MARY VEREEN, comp. Jun. 1988 66 p Conference held in Huntsville, Ala., 2-3 Nov. 1987; sponsored by NASA, Marshall Space Flight Center, Huntsville, Ala. and Alabama Univ., Huntsville Sponsored by NASA, Washington
(NASA-CP-2492-PT-2; M-576-PT-2; NAS 1.55:2492-PT-2) Avail: NTIS HC A04/MF A01 CSCL 09B
COMPUTER PROGRAMS, CONFERENCES, EXPERT SYSTEMS, SOFTWARE TOOLS, SPACE STATIONS

N88-29351*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
SECOND CONFERENCE ON ARTIFICIAL INTELLIGENCE FOR SPACE APPLICATIONS
THOMAS DOLLMAN, comp. Aug. 1988 709 p Conference held in Huntsville, Ala., 13-14 Nov. 1986; sponsored by NASA, Marshall Space Flight Center, Huntsville, Ala. and Alabama Univ., Huntsville Sponsored by NASA, Washington, D.C.
(NASA-CP-3007; M-577; NAS 1.55:3007) Avail: NTIS HC A99/MF E03 CSCL 09B
AUTOMATIC CONTROL, COMPUTER AIDED DESIGN, COMPUTER VISION, EXPERT SYSTEMS, ROBOTICS, SPACE STATIONS

63

CYBERNETICS

Includes feedback and control theory, artificial intelligence, robotics and expert systems.

N88-30330*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
THE 1988 GODDARD CONFERENCE ON SPACE APPLICATIONS OF ARTIFICIAL INTELLIGENCE
JAMES RASH, ed. and PETER HUGHES, ed. Aug. 1988 437 p Conference held in Greenbelt, Md., 24 May 1988 Sponsored by NASA, Washington, D.C.
(NASA-CP-3009; REPT-88B0212; NAS 1.55:3009) Avail: NTIS HC A19/MF A01 CSCL 09B
AEROSPACE ENGINEERING, ARTIFICIAL INTELLIGENCE, COMPUTERIZED SIMULATION, CONFERENCES, EXPERT SYSTEMS, IMAGE PROCESSING, MISSION PLANNING

65

STATISTICS AND PROBABILITY

Includes data sampling and smoothing; Monte Carlo method; and stochastic processes.

N88-17380*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
SURE RELIABILITY ANALYSIS: PROGRAM AND MATHEMATICS
RICKY W. BUTLER and ALLAN L. WHITE Mar. 1988 77 p
(NASA-TP-2764; L-16263; NAS 1.60:2764) Avail: NTIS HC A05/MF A01 CSCL 12A
APPLICATIONS PROGRAMS (COMPUTERS), FAULT TOLERANCE, MARKOV PROCESSES, MATHEMATICAL MODELS, RELIABILITY ANALYSIS

N88-22653*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
ANALYSIS AND TESTING OF THE SURE PROGRAM
KELLY J. DOTSON 1988 1 p
(NASA-TP-2817; L-16413; NAS 1.60:2817) PREVIEW CSCL 12A
COMPUTER PROGRAMS, ERROR ANALYSIS, FAULT TOLERANCE, MARKOV PROCESSES, MATHEMATICAL MODELS, RELIABILITY ANALYSIS

66

SYSTEMS ANALYSIS

Includes mathematical modeling; network analysis; and operations research.

N88-21740*# National Aeronautics and Space Administration. Hugh L. Dryden Flight Research Center, Edwards, Calif.
USER'S MANUAL FOR LINEAR, A FORTRAN PROGRAM TO DERIVE LINEAR AIRCRAFT MODELS
EUGENE L. DUKE, BRIAN P. PATTERSON, and ROBERT F. ANTONIEWICZ Dec. 1987 109 p
(NASA-TP-2768; H-1259; NAS 1.60:2768) Avail: NTIS HC A06/MF A01 CSCL 12B
AIRCRAFT MODELS, COMPUTER PROGRAMS, FORTRAN, LINEARIZATION

71

ACOUSTICS

Includes sound generation, transmission, and attenuation.

N88-11450*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
EVALUATION OF A SCALE-MODEL EXPERIMENT TO INVESTIGATE LONG-RANGE ACOUSTIC PROPAGATION
TONY L. PARROTT, GERRY L. MCANINCH, and INGRID A. CARLBERG Nov. 1987 55 p
(NASA-TP-2748; L-16300; NAS 1.60:2748) Avail: NTIS HC A04/MF A01 CSCL 20A
ACOUSTICS, FEASIBILITY ANALYSIS, MATHEMATICAL MODELS, SCALE MODELS, TERRAIN, WAVE PROPAGATION

N88-13002*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
MEASUREMENT OF VELOCITY AND VORTICITY FIELDS IN THE WAKE OF AN AIRFOIL IN PERIODIC PITCHING MOTION
EARL R. BOOTH, JR. Dec. 1987 31 p
(NASA-TP-2780; L-16339; NAS 1.60:2780) Avail: NTIS HC A03/MF A01 CSCL 20A
AIRFOILS, PITCH (INCLINATION), VORTICES, VORTICITY, WAKES

N88-16510*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
SHOCK STRUCTURE AND NOISE OF SUPERSONIC JETS IN SIMULATED FLIGHT TO MACH 0.4
THOMAS D. NORUM and JOHN G. SHEARIN Feb. 1988 187 p
(NASA-TP-2785; L-16341; NAS 1.60:2785) Avail: NTIS HC A09/MF A01 CSCL 20A
JET AIRCRAFT NOISE, MACH NUMBER, SHOCK WAVES, SUPERSONIC AIRCRAFT

N88-17440*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
MEASURED AND CALCULATED ACOUSTIC ATTENUATION RATES OF TUNED RESONATOR ARRAYS FOR TWO SURFACE IMPEDANCE DISTRIBUTION MODELS WITH FLOW
TONY L. PARROTT, A. LOUIS ABRAHAMSON, and MICHAEL G. JONES (PRC Kentron, Inc., Hampton, Va.) Jan. 1988 51 p
(NASA-TP-2766; L-16352; NAS 1.60:2766) Avail: NTIS HC A04/MF A01 CSCL 20A
ACOUSTIC ATTENUATION, ACOUSTIC IMPEDANCE, CAVITY RESONATORS, ENGINE NOISE, FINITE ELEMENT METHOD, GRAZING FLOW, NOISE REDUCTION

N88-17441*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
ANNOYANCE CAUSED BY ADVANCED TURBOPROP AIRCRAFT FLYOVER NOISE: SINGLE-ROTATING PROPELLER CONFIGURATION
DAVID A. MCCURDY Mar. 1988 43 p
(NASA-TP-2782; L-16301; NAS 1.60:2782) Avail: NTIS HC A03/MF A01 CSCL 20A
NOISE INTENSITY, PROPELLER FANS, TOLERANCES (PHYSIOLOGY), ENGINE NOISE, JET AIRCRAFT NOISE, NOISE TOLERANCE

N88-22710*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
ADVANCING-SIDE DIRECTIVITY AND RETREATING-SIDE INTERACTIONS OF MODEL ROTOR BLADE-VORTEX INTERACTION NOISE
R. M. MARTIN, W. R. SPLETTSTOESSER, J. W. ELLIOTT, and K.-J. SCHULTZ (Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt, Brunswick, West Germany) May 1988 43 p
(NASA-TP-2784; L-16354; NAS 1.60:2784; AVSCOM-TR-87-B-3) Avail: NTIS HC A03/MF A01 CSCL 20A
BLADE-VORTEX INTERACTION, ROTOR AERODYNAMICS

N88-26907*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
HELICOPTER MAIN-ROTOR NOISE: DETERMINATION OF SOURCE CONTRIBUTIONS USING SCALED MODEL DATA
THOMAS F. BROOKS, J. RALPH JOLLY, JR. (Planning Research Corp., Hampton, Va.), and MICHAEL A. MARCOLINI Aug. 1988 66 p
(NASA-TP-2825; L-16399; NAS 1.60:2825) Avail: NTIS HC A04/MF A01 CSCL 20A
AIRCRAFT NOISE, BLADE SLAP NOISE, BO-105 HELICOPTER, ROTARY WINGS, WIND TUNNEL TESTS

73

NUCLEAR AND HIGH-ENERGY PHYSICS

Includes elementary and nuclear particles; and reactor theory.

N88-13015*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
NUCLEAR TECHNIQUES IN STUDIES OF CONDENSED MATTER
JAG J. SINGH Aug. 1987 22 p
(NASA-RP-1195; L-16361; NAS 1.61:1195) Avail: NTIS HC A03/MF A01 CSCL 20H
Nuclear techniques have played an important role in the studies of materials over the past several decades. For example, X-ray diffraction, neutron diffraction, neutron activation, and particle- or photon-induced X-ray emission techniques have been used extensively for the elucidation of structural and compositional details of materials. Several new techniques have been developed recently. Four such techniques are briefly reviewed which have great potential in the study and development of new materials. Of these four, Mossbauer spectroscopy, muon spin rotation, and positron annihilation spectroscopy techniques exploit their great sensitivity to the local atomic environments in the test materials. Interest in synchrotron radiation, on the other hand, stems from its special properties, such as high intensity, high degree of polarization, and high monochromaticity. It is hoped that this brief review will stimulate interest in the exploitation of these newer techniques for the development of improved materials. Author

N88-30402*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
EIKONAL SOLUTIONS TO OPTICAL MODEL COUPLED-CHANNEL EQUATIONS
FRANCIS A. CUCINOTTA, GOVIND S. KHANDELWAL, KHIN M. MAUNG (Old Dominion Univ., Norfolk, Va.), LAWRENCE W. TOWNSEND, and JOHN W. WILSON Nov. 1988 30 p
(NASA-TP-2830; L-16462; NAS 1.60:2830) Avail: NTIS HC A03/MF A01 CSCL 20H
EIKONAL EQUATION, ELASTIC SCATTERING, HEAVY IONS, INELASTIC SCATTERING, IONIC COLLISIONS, NUCLEAR SCATTERING, SCATTERING AMPLITUDE

75

PLASMA PHYSICS

Includes magnetohydrodynamics and plasma fusion.

N88-18443*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
LASER PRODUCTION AND HEATING OF PLASMA FOR MHD APPLICATION
N. W. JALUFKA Mar. 1988 11 p
(NASA-TP-2798; L-16373; NAS 1.60:2798) Avail: NTIS HC A03/MF A01 CSCL 20I
ELECTRIC GENERATORS, ENERGY CONVERSION EFFICIENCY, MAGNETOHYDRODYNAMIC GENERATORS, PLASMA HEATING

81

ADMINISTRATION AND MANAGEMENT

Includes management planning and research.

N88-21867* National Aeronautics and Space Administration, Washington, D.C.
MANAGEMENT: A BIBLIOGRAPHY FOR NASA MANAGERS
Apr. 1988 158 p
(NASA-SP-7500(22); NAS 1.21:7500(22)) Avail: NTIS HC A08 CSCL 05A
This bibliography lists 653 reports, articles and other documents introduced into the NASA scientific and technical information system in 1987. Items are selected and grouped according to their usefulness to the manager as manager. Citations are grouped into ten subject categories; human factors and personnel issues; management theory and techniques; industrial management and manufacturing; robotics and expert systems; computers and information management; research and development; economics, costs and markets; logistics and operations management, reliability and quality control; and legality, legislation, and policy. Author

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DOCUMENTATION AND INFORMATION SCIENCE

Includes information management; information storage and retrieval technology; technical writing; graphic arts; and micrography.

N88-15732* National Aeronautics and Space Administration, Washington, D.C.
NASA PATENT ABSTRACTS BIBLIOGRAPHY: A CONTINUING BIBLIOGRAPHY. SECTION 1: ABSTRACTS (SUPPLEMENT 32)
Jan. 1988 61 p
(NASA-SP-7039(32)-SECT-1-ABST; NAS 1.21:7039(32)-SECT-1-ABST) Avail: NTIS HC A04; NTIS standing order as PB 88-911100, $12.50 domestic, $25.00 foreign CSCL 05B

Abstracts are provided for 136 patents and patent applications entered into the NASA scientific and technical information system during the period July through December 1987. Each entry consists of a citation , an abstract, and in most cases, a key illustration selected from the patent or patent application. Author

N88-16575* National Aeronautics and Space Administration, Washington, D.C.
NASA THESAURUS SUPPLEMENT: A FOUR PART CUMULATIVE SUPPLEMENT TO THE 1985 EDITION OF THE NASA THESAURUS
Jan. 1988 363 p
(NASA-SP-7053(SUPP-4); NAS 1.21:7053(SUPP-4)) Avail: NTIS HC A16 CSCL 05B

The four part cumulative NASA Thesaurus Supplement to the 1985 edition of the NASA Thesaurus includes Part 1, Hierarchical Listing, Part 2, Access Vocabulary, Part 3, NASA Thesaurus Definitions, and Part 4, Changes. The semiannual supplement gives complete hierarchies for new terms. Author

N88-18511* National Aeronautics and Space Administration, Washington, D.C.
NASA PATENT ABSTRACTS BIBLIOGRAPHY: A CONTINUING BIBLIOGRAPHY. SECTION 2: INDEXES (SUPPLEMENT 32)
Jan. 1988 499 p
(NASA-SP-7039(32)-SECT-2; NAS 1.21:7039(32)-SECT-2) Avail: NTIS HC A21; NTIS standing order as PB88-911100, $26.50 domestic, $53.00 foreign CSCL 05B

A subject index is provided for over 4700 patents and patent applications for the period May 1969 through December 1987. Additional indexes list personal authors, corporate authors, contract numbers, NASA case numbers, U.S. patent class numbers, U.S. patent numbers, and NASA accession numbers. Author

N88-22830*# National Aeronautics and Space Administration, Washington, D.C.
NASA SCIENTIFIC AND TECHNICAL PUBLICATIONS: A CATALOG OF SPECIAL PUBLICATIONS, REFERENCE PUBLICATIONS, CONFERENCE PUBLICATIONS, AND TECHNICAL PAPERS, 1987
Mar. 1988 69 p
(NASA-SP-7063(02); NAS 1.21:7063(02)) Avail: NTIS HC free as PR-828; NASA Scientific and Technical Information Facility, P.O. Box 8757, BWI Airport, Md. 21240 HC free CSCL 05B

This catalog lists 239 citations of all NASA Special Publications, NASA Reference Publications, NASA Conference Publications, and NASA Technical Papers that were entered in the NASA scientific and technical information database during accession year 1987. The entries are grouped by subject category. Indexes of subject terms, personal authors, and NASA report numbers are provided. Author

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LAW, POLITICAL SCIENCE AND SPACE POLICY

Includes NASA appropriation hearings; aviation law; space law and policy; international law; international cooperation; and patent policy.

N88-19375*# National Aeronautics and Space Administration, Washington, D.C.
SPACELAB: AN INTERNATIONAL SUCCESS STORY
DOUGLAS R. LORD (Science Applications International Corp., Washington, D.C.) 1987 565 p Original contains color illustrations
(NASW-4092)
(NASA-SP-487; NAS 1.21:487; LC-86-17979) Avail: NTIS HC A24/MF A01 CSCL 05D

Spacelab is a European-developed and U.S.-operated space laboratory carried in the cargo bay of the Space Shuttle Orbiter. This story of the Spacelab Development Program traces the program from the origin of the Spacelab concept, describing negotiations and agreements for European participation and the role of Europe and the United States in system development, operational capability development, and utilization planning. It also considers the joint management structure, coordination, and experience in solving management and technical interface problems. The book is not an exhaustive historical treatise, but an informative and readable story of the evolution and technical accomplishments of this unique program in manned space flight and of some of the unusual political and human interest aspects of the program from the viewpoint of one of the key participants. Author

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SPACE SCIENCES (GENERAL)

N88-25390*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
A STUDY OF SPACE STATION CONTAMINATION EFFECTS
M. R. TORR, ed., J. F. SPANN, ed., and T. W. MOOREHEAD, ed. May 1988 141 p Workshop held in Hilton Head Island, S.C., 29-30 Oct. 1987 Sponsored by NASA, Washington
(NASA-CP-3002; M-586; NAS 1.55:3002) Avail: NTIS HC A07/MF A01 CSCL 22B

CONFERENCES, CONTAMINANTS, EARTH ORBITAL ENVIRONMENTS, SPACE STATIONS, SPACECRAFT CONTAMINATION

89

ASTRONOMY

Includes radio, gamma-ray, and infrared astronomy; and astrometry.

N88-15738*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
CATALOG OF INFRARED OBSERVATIONS. PART 1: DATA Second Edition
DANIEL Y. GEZARI, MARION SCHMITZ (Computer Sciences Corp., Beltsville, Md.), and JAYLEE M. MEAD Dec. 1987 625 p

(NASA-RP-1196-PT-1-ED-2; NAS 1.61:1196-PT-1-ED-2) Avail: NTIS HC A99/MF A01 CSCL 03A

The Catalog of Infrared Observations (CIO) is a compilation of infrared astronomical observational data obtained from an extensive literature search of astronomical journals and major astronomical catalogs and surveys. The literature searches are complete for 1965 through 1986 in this Second Edition. The Catalog is published in two parts, with the observational data (roughly 200,000 observations of 20,000 individual sources) listed in Part I, and supporting appendices in Part II. The expanded Second Edition contains a new feature: complete IRAS 4-band data for all CIO sources detected, listed with the main Catalog observations, as well as in complete detail in the Appendix. The appendices include an atlas of infrared source positions, two bibliographies of infrared literature upon which the search was based, and, keyed to the main Catalog listings (organized alphabetically by author and then chronologically), an atlas of infrared spectral ranges, and IRAS data from the CIO sources. The complete CIO database is available to qualified users in printed microfiche and magnetic tape formats. Author

N88-16615*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
CATALOG OF INFRARED OBSERVATIONS. PART 2: APPENDIXES Second Edition
DANIEL Y. GEZARI, MARION SCHMITZ, and JAYLEE M. MEAD Dec. 1987 343 p
(NASA-RP-1196-PT-2-ED-2; NAS 1.61:1196-PT-2-ED-2) Avail: NTIS HC A15/MF A01 CSCL 03A

The Catalog of Infrared Observations (CIO) is a compilation of infrared astronomical observational data obtained from an extensive literature search of astronomical journals and major astronomical catalogs and surveys. The literature searches are complete for years 1965 to 1986. Supporting appendixes are published in this part. The appendices include an atlas of infrared source positions, two bibliographies of infrared literature upon which the search was based, and, keyed to the main Catalog listings (organized alphabetically by first author, and by date), an atlas of infrared spectral ranges, and IRAS data for the CIO sources. The complete CIO database is available to qualified users in printed microfiche and magnetic tape formats. Author

N88-24553*# National Aeronautics and Space Administration, Washington, D.C.
NASA THESAURUS: ASTRONOMY VOCABULARY
1988 112 p Presented at the International Astronomical Union Conference, Baltimore, Md., 27-31 Jul. 1988
(NASA-SP-7069; NAS 1.21:7069) Avail: NTIS HC A06 CSCL 03A

A terminology of descriptors used by the NASA Scientific and Technical information effort to index documents in the area of astronomy is presented. The terms are listed in hierarchical format derived from the 1988 edition of the NASA Thesaurus Volume 1 -- Hierarchical Listing. Over 1600 terms are included. In addition to astronomy, space sciences covered include astrophysics, cosmology, lunar flight and exploration, meteors and meteorites, celestial mechanics, planetary flight and exploration, and planetary science. Author

N88-30545*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
FAR INFRARED SUPPLEMENT: CATALOG OF INFRARED OBSERVATIONS, SECOND EDITION
DANIEL Y. GEZARI, MARION SCHMITZ (Computer Sciences Corp., Beltsville, Md.), and JAYLEE M. MEAD Aug. 1988 233 p
(NASA-RP-1205; REPT-88B-121; NAS 1.61:1205) Avail: NTIS HC A11/MF A01 CSCL 03A

The Far Infrared Supplement: Catalog of Infrared Observations summarizes all infrared astronomical observations at far infrared wavelengths (5 to 1000 microns) published in the scientific literature from 1965 through 1986. The Supplement list contain 25 percent of the observations in the full Catalog of Infrared Observations (CIO), and essentially eliminates most visible stars from the listings. The Supplement is thus more compact than the main catalog, and is intended for easy reference during astronomical observations. The Far Infrared Supplement (2nd Edition) includes the Index of Infrared Source Positions and the Bibliography of Infrared Astronomy for the subset of far infrared observations listed. Author

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ASTROPHYSICS

Includes cosmology; celestial mechanics; space plasmas; and interstellar and interplanetary gases and dust.

N88-11592*# National Aeronautics and Space Administration, Washington, D.C.
THE M-TYPE STARS
HOLLIS RALPH JOHNSON, FRANCOIS R. QUERCI, STUART JORDAN, ed., RICHARD THOMAS, ed., LEO GOLDBERG (Kitt Peak National Observatory, Tucson, Ariz.), and JEAN-CLAUDE PECKER 1987 576 p Prepared in cooperation with CNRS, Paris, France Its Monograph Series on Nonthermal Phenomena in Stellar Atmospheres, Volume 5
(NASA-SP-492; NAS 1.21:492; LC-87-11340) Avail: SOD HC $26.00 as 033-000-01007-9; NTIS MF A01 CSCL 03B

The papers in this volume cover the following topics: (1) basic properties and photometric variability of M and related stars; (2) spectroscopy and nonthermal processes; (3) circumstellar radio molecular lines; (4) circumstellar shells, the formation of grains, and radiation transfer; (5) mass loss; (6) circumstellar chemistry; (7) thermal atmospheric models; (8) quasi-thermal models; (9) observations on the atmospheres of M dwarfs; and (1) theoretical work on M dwarfs. For individual titles, see N88-11593 through N88-11602.

N88-20235*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
WORKSHOP ON TECHNOLOGY DEVELOPMENT ISSUES FOR THE LARGE DEPLOYABLE REFLECTOR (LDR)
KENJI NISHIOKA, ed. Feb. 1988 118 p Workshop held in Asilomar, Calif., 17-22 Mar. 1985
(NASA-CP-2407; A-85394; NAS 1.55:2407) Avail: NTIS HC A06/MF A01 CSCL 03B

CRYOGENIC COOLING, DEPLOYMENT, INFRARED ASTRONOMY, INFRARED TELESCOPES, LARGE SPACE STRUCTURES, REFLECTORS, TECHNOLOGY ASSESSMENT

N88-28843* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
INTERNATIONAL ULTRAVIOLET EXPLORER SPECTRAL ATLAS OF PLANETARY NEBULAE, CENTRAL STARS, AND RELATED OBJECTS
WALTER A. FEIBELMAN, NANCY A. OLIVERSEN, JOY NICHOLSBOHLIN, and MATTHEW P. GARHART (Computer Sciences Corp., Beltsville, Md.) Jun. 1988 380 p
(NAS5-28749)
(NASA-RP-1203; NAS 1.61:1203) Avail: NTIS HC A17 CSCL 03B

The International Ultraviolet Explorer (IUE) archives contain a wealth of information on high quality ultraviolet spectra of approximately 180 planetary nebulae, their central stars, and related objects. Selected are representative low-dispersion IUE spectra in the range 1200 to 3200 A for 177 objects arranged by Right Ascension (RA) for this atlas. For most entries, the combined short wavelength (SWP) (1200to 1900) and long wavelength (LWR) (or LWP, 1900 to 3200 A) regions are shown on 30 cm by 10 cm Calcomp plots on a uniform scale to facilitate intercomparison of the spectra. Each calibrated spectrum is also shown on an expanded vertical scale to bring out some of the weaker features. Author

N88-29652*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
CATALOG OF OPEN CLUSTERS AND ASSOCIATED INTERSTELLAR MATTER
DAVID LEISAWITZ Jun. 1988 294 p
(NASA-RP-1202; REPT-88B0152; NAS 1.61:1202) Avail: NTIS HC A13/MF A01 CSCL 03B

The Catalog of Open Clusters and Associated Interstellar Matter summarizes observations of 128 open clusters and their associated ionized, atomic, and molecular interstellar matter. Cluster sizes, distances, radial velocities, ages, and masses, and the radial velocities and masses of associated interstellar medium components, are given. The database contains information from approximately 400 references published in the scientific literature before 1988. Author

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LUNAR AND PLANETARY EXPLORATION

Includes planetology; and manned and unmanned flights.

N88-24564*# National Aeronautics and Space Administration, Washington, D.C.
REFLECTANCE SPECTROSCOPY IN PLANETARY SCIENCE: REVIEW AND STRATEGY FOR THE FUTURE
THOMAS B. MCCORD, ed. (Hawaii Univ., Honolulu.) Jun. 1987 43 p
(NASA-SP-493; NAS 1.21:493; LC-87-28154) Avail: NTIS HC A03/MF A01 CSCL 03B

Reflectance spectroscopy is a remote sensing technique used to study the surfaces and atmospheres of solar system bodies. It provides first-order information on the presence and amounts of certain ions, molecules, and minerals on a surface or in an atmosphere. Reflectance spectroscopy has become one of the most important investigations conducted on most current and planned NASA Solar System Exploration Program space missions. This book reviews the field of reflectance spectroscopy, including information on the scientific technique, contributions, present conditions, and future directions and needs. Author

N88-26279*# National Aeronautics and Space Administration, Washington, D.C.
PLANETARY GEOLOGY: GOALS, FUTURE DIRECTIONS, AND RECOMMENDATIONS Final Report
Aug. 1988 23 p Workshop held in Tempe, Ariz., Jan. 1987
(NASA-CP-3005; NAS 1.55:3005) Avail: NTIS HC A03/MF A01 CSCL 03B

PLANETARY GEOLOGY, PLANETOLOGY, SPACE EXPLORATION

92

SOLAR PHYSICS

Includes solar activity, solar flares, solar radiation and sunspots.

N89-11609*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
THEORETICAL PROBLEMS IN HIGH RESOLUTION SOLAR PHYSICS, 2
G. ATHAY, ed. (National Center for Atmospheric Research, Boulder, Colo.) and D. S. SPICER, ed. Sep. 1987 141 p Workshop held in Boulder, Colo., 15-17 Sep. 1986
(NASA-CP-2483; REPT-87B0401; NAS 1.55:2483) Avail: NTIS HC A07/MF A01 CSCL 03B

HIGH RESOLUTION, MAGNETIC FLUX, SOLAR MAGNETIC FIELD, SOLAR OBSERVATORIES, SOLAR PHYSICS

99

GENERAL

N88-14062*# National Aeronautics and Space Administration, Washington, D.C.
ASTRONAUTICS AND AERONAUTICS, 1978: A CHRONOLOGY
BETTE R. JANSON (Creative Resources and Planning, Fairfax, Va.) 1986 394 p *Its* NASA History Series
(NASA ORDER W-73289)
(NASA-SP-4023; NAS 1.21:4023) Avail: SOD HC $13.00 as 033-000-01010-9; NTIS MF A01 CSCL 05D

This is the 18th in a series of annual chronologies of significant events in the fields of astronautics and aeronautics. Events covered are international as well as national and political as well as scientific and technical. This series is a reference work for historians, NASA personnel, government agencies, congressional staffs, and the media. Author

N88-25428*# National Aeronautics and Space Administration, Washington, D.C.
NASA HISTORY DATA BOOK. VOLUME 1: NASA RESOURCES 1958-1968
JANE VANNIMMEN, LEONARD C. BRUNO, and ROBERT L. ROSHOLT 1988 639 p
(NASW-3597)
(NASA-SP-4012-VOL-1; NAS 1.21:4012-VOL-1; LC-74-600126)
Avail: NTIS MF A01; SOD HC $57.00 in set of 3 as 033-000-01017-6 CSCL 05D

This is Volume 1, NASA Resources 1958-1968, of a three-volume series providing a 20-year compilation of summary statistical and other data descriptive of NASA's programs in aeronautics and manned and unmanned spaceflight. This series is an important component of NASA published historical reference works, used by NASA personnel, managers, external researchers, and other government agencies. Author

N88-25429*# National Aeronautics and Space Administration, Washington, D.C.
NASA HISTORICAL DATA BOOK. VOLUME 2: PROGRAMS AND PROJECTS 1958-1968
LINDA NEUMAN EZELL 1988 652 p
(NASW-3597)
(NASA-SP-4012-VOL-2; NAS 1.21:4012-VOL-2; LC-74-600126)
Avail: NTIS MF A01; SOD HC $57.00 in set of 3 as 033-000-01017-6 CSCL 05D

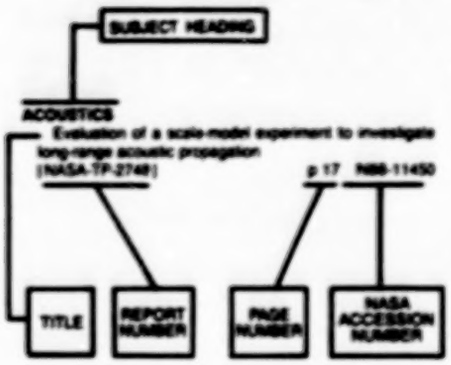
This is Volume 2, Programs and Projects 1958-1968, of a three-volume series providing a 20-year compilation of summary statistical and other data descriptive of NASA's programs in aeronautics and manned and unmanned spaceflight. This series is an important component of NASA published historical reference works, used by NASA personnel, managers, external researchers, and other government agencies. Author

N88-25430*# National Aeronautics and Space Administration, Washington, D.C.
NASA HISTORICAL DATA BOOK. VOLUME 3: PROGRAMS AND PROJECTS 1969-1978
LINDA NEUMAN EZELL 1988 492 p
(NASW-3597)
(NASA-SP-4012-VOL-3; NAS 1.21:4012-VOL-3; LC-74-600126)
Avail: NTIS MF A01; SOD HC $57.00 in set of 3 as 033-000-01017-6 CSCL 05D

This is Volume 3, Programs and Projects 1969-1978, of a three-volume series providing a 20-year compilation of summary

statistical and other data descriptive of NASA's programs in aeronautics and manned and unmanned spaceflight. This series is an important component of NASA published historical reference works, used by NASA personnel, managers, external researchers, and other government agencies.
Author

Typical Subject Index Listing



The subject heading is a key to the subject content of the document. The title is used to provide a description of the subject matter. When the title is insufficiently descriptive of document content, a title extension is added, separated from the title by three hyphens. The (NASA or AIAA) accession number and the page number are included in each entry to assist the user in locating the abstract in the abstract section. If applicable, a report number is also included as an aid in identifying the document. Under any one subject heading, the accession numbers are arranged in sequence with the AIAA accession numbers appearing first.

A

ACCUMULATORS
Performance of a small, graphite electrode, multistage depressed collector with a 500-W, continuous wave, 4.8- to 9.6-GHz traveling wave tube
[NASA-TP-2788] p 10 N88-15146

ACOUSTIC ATTENUATION
Measured and calculated acoustic attenuation rates of tuned resonator arrays for two surface impedance distribution models with flow
[NASA-TP-2766] p 18 N88-17440

ACOUSTIC IMPEDANCE
Measured and calculated acoustic attenuation rates of tuned resonator arrays for two surface impedance distribution models with flow
[NASA-TP-2766] p 18 N88-17440

ACOUSTICS
Evaluation of a scale-model experiment to investigate long-range acoustic propagation
[NASA-TP-2748] p 17 N88-11450

ACTIVE CONTROL
Handling qualities of a wide-body transport airplane utilizing Pitch Active Control Systems (PACS) for relaxed static stability application
[NASA-TP-2482] p 6 N88-14987

ACTUATORS
The 22nd Aerospace Mechanisms Symposium
[NASA-CP-2506] p 11 N88-21458

AEROACOUSTICS
NASA/Army Rotorcraft Technology. Volume 2: Materials and Structures, Propulsion and Drive Systems, Flight Dynamics and Control, and Acoustics
[NASA-CP-2495-VOL-2] p 1 N88-16832

AERODYNAMIC CHARACTERISTICS
Planform effects on the supersonic aerodynamics of multibody configurations
[NASA-TP-2762] p 2 N88-12454

Aerodynamic characteristics of wings designed with a combined-theory method to cruise at a Mach number of 4.5
[NASA-TP-2799] p 3 N88-19420

Influence of wind shear on the aerodynamic characteristics of airplanes
[NASA-TP-2527] p 4 N88-26344

AERODYNAMIC CONFIGURATIONS
Langley Symposium on Aerodynamics, volume 1
[NASA-CP-2397] p 1 N88-14826

A performance index approach to aerodynamic design with the use of analysis codes only
[NASA-TP-2805] p 2 N88-18552

A review of technologies applicable to low-speed flight of high-performance aircraft investigated in the Langley 14- x 22-foot subsonic tunnel
[NASA-TP-2796] p 3 N88-20264

AERODYNAMIC DRAG
Planform effects on the supersonic aerodynamics of multibody configurations
[NASA-TP-2762] p 2 N88-12454

AERODYNAMIC FORCES
Nonlinear programming extensions to rational function approximation methods for unsteady aerodynamic forces
[NASA-TP-2776] p 5 N88-24623

AERODYNAMIC HEATING
Trajectory characteristics and heating of hypervelocity projectiles having large ballistic coefficients
[NASA-TP-2614] p 2 N88-19412

AERODYNAMIC LOADS
Cornering characteristics of the main-gear tire of the space shuttle orbiter
[NASA-TP-2790] p 4 N88-18583

AERODYNAMIC STABILITY
Effects of the installation and operation of jet-exhaust yaw vanes on the longitudinal and lateral-directional characteristics of the F-14 airplane
[NASA-TP-2769] p 2 N88-12455

Integrated Technology Rotor Methodology Assessment Workshop
[NASA-CP-10007] p 1 N88-27148

AERODYNAMICS
Supersonic aerodynamics of delta wings
[NASA-TP-2771] p 2 N88-17615

Aeronautical engineering: A cumulative index to a continuing bibliography
[NASA-SP-7037(222)] p 3 N88-19416

Joint University Program for Air Transportation Research, 1986
[NASA-CP-2502] p 1 N88-23715

Nonlinear programming extensions to rational function approximation methods for unsteady aerodynamic forces
[NASA-TP-2776] p 5 N88-24623

Aeronautical engineering: A continuing bibliography with indexes
[NASA-SP-7037(229)] p 1 N88-27163

AEROELASTICITY
NASA/Army Rotorcraft Technology. Volume 1: Aerodynamics, and Dynamics and Aeroelasticity
[NASA-CP-2495-VOL-1] p 1 N88-16825

An experimental investigation of the flap-lag-torsion aeroelastic stability of a small-scale hingeless helicopter rotor in hover
[NASA-TP-2546] p 3 N88-20257

Shape sensitivity analysis of wing static aeroelastic characteristics
[NASA-TP-2808] p 5 N88-22031

Lewis Structures Technology, 1988. Volume 1: Structural Dynamics
[NASA-CP-3003-VOL-1] p 12 N88-23226

Integrated Technology Rotor Methodology Assessment Workshop
[NASA-CP-10007] p 1 N88-27148

AERONAUTICAL ENGINEERING
Astronautics and aeronautics, 1978: A chronology
[NASA-SP-4023] p 21 N88-14062

Aeronautical engineering: A cumulative index to a continuing bibliography
[NASA-SP-7037(222)] p 3 N88-19416

NASA history data book. Volume 1: NASA resources 1958-1968
[NASA-SP-4012-VOL-1] p 21 N88-25426

Aeronautical engineering: A continuing bibliography with indexes
[NASA-SP-7037(229)] p 1 N88-27163

AERONAUTICS
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NASA historical data book. Volume 3: Programs and projects 1969-1978
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AEROSOLS
Airborne particulate matter in spacecraft
[NASA-CP-2499] p 15 N88-14823

SAM 2 data user's guide
[NASA-RP-1200] p 13 N88-25094

Forty-eight-inch lidar aerosol measurements taken at the Langley Research Center, May 1974 to December 1987
[NASA-RP-1209] p 14 N88-29234

AEROSPACE ENGINEERING
Astronautics and aeronautics, 1978: A chronology
[NASA-SP-4023] p 21 N88-14062

The 1988 Goddard Conference on Space Applications of Artificial Intelligence
[NASA-CP-3009] p 17 N88-30330

AEROSPACE ENVIRONMENTS
Airborne particulate matter in spacecraft
[NASA-CP-2499] p 15 N88-14823

AEROSPACE INDUSTRY
Wind shear detection. Forward-looking sensor technology
[NASA-CP-10004] p 4 N88-14970

AEROSPACE MEDICINE
Aerospace medicine and biology: A cumulative index to a continuing bibliography (supplement 306)
[NASA-SP-7011(306)] p 15 N88-18180

Aerospace medicine and biology: A continuing bibliography with indexes (supplement 315)
[NASA-SP-7011(315)] p 15 N88-30281

AEROSPACE SCIENCES
NASA scientific and technical publications: A catalog of Special Publications, Reference Publications, Conference Publications, and Technical Papers, 1987
[NASA-SP-7063(02)] p 19 N88-22630

AEROTHERMODYNAMICS
Aerothermal tests of quilted dome models on a flat plate at a Mach number of 6.5
[NASA-TP-2804] p 10 N88-22325

AFTERBODIES
Comparison of wind tunnel and flight test afterbody and nozzle pressures for a twin-jet fighter aircraft at transonic speeds
[NASA-TP-2588] p 2 N88-10765

Effect of empennage arrangement on single-engine nozzle/afterbody static pressures at transonic speeds
[NASA-TP-2753] p 2 N88-10771

AGRICULTURE
Earth resources: A continuing bibliography with indexes (issue 57)
[NASA-SP-7041(57)] p 13 N88-23314

AIR
A rapid method for the computation of equilibrium chemical composition of air to 15000 K
[NASA-TP-2792] p 8 N88-16830

AIR PURIFICATION
Airborne particulate matter in spacecraft
[NASA-CP-2499] p 15 N88-14823

AIR QUALITY
Airborne particulate matter in spacecraft
[NASA-CP-2499] p 15 N88-14823

AIRBORNE EQUIPMENT
Airborne Wind Shear Detection and Warning Systems' First Combined Manufacturers' and Technologists' Conference
[NASA-CP-10006] p 4 N88-17816

AIRCRAFT CONFIGURATIONS
Planform effects on the supersonic aerodynamics of multibody configurations
[NASA-TP-2762] p 2 N88-12454

AIRCRAFT CONTROL
Effects of the installation and operation of jet-exhaust yaw vanes on the longitudinal and lateral-directional characteristics of the F-14 airplane
[NASA-TP-2789] p 2 N88-12455
Proceedings of the Circulation-Control Workshop, 1986
[NASA-CP-2432] p 2 N88-17586
Airborne Wind Shear Detection and Warning Systems: First Combined Manufacturers' and Technologists' Conference
[NASA-CP-10006] p 4 N88-17616
Rotorcraft flight-propulsion control integration: An eclectic design concept
[NASA-TP-2915] p 6 N88-19475
Joint University Program for Air Transportation Research, 1986
[NASA-CP-2502] p 1 N88-23715
Influence of wind shear on the aerodynamic characteristics of airplanes
[NASA-TP-2627] p 4 N88-26344

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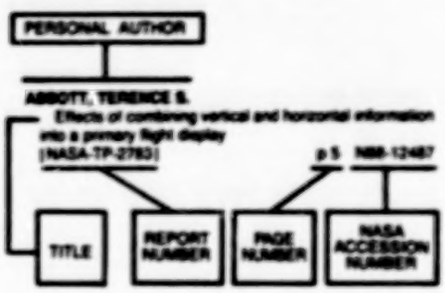

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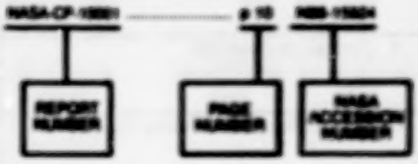

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